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# NATIONAL PLUMBING PRODUCTS EFFICIENCY ACT OF 1989

## HEARING

BEFORE THE

SUBCOMMITTEE ON THE CONSUMER

OF THE

## COMMITTEE ON COMMERCE, SCIENCE, AND TRANSPORTATION UNITED STATES SENATE

ONE HUNDRED FIRST CONGRESS

FIRST SESSION

ON

## S. 583

TO ESTABLISH NATIONAL STANDARDS FOR THE MANUFACTURE AND LABELING OF CERTAIN PLUMBING PRODUCTS IN ORDER TO CONSERVE AND PROTECT WATER RESOURCES, AND FOR OTHER PURPOSES

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OCTOBER 4, 1989

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Printed for the use of the
Committee on Commerce, Science, and Transportation

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# NATIONAL PLUMBING EFFICIENCY ACT OF 1989

WEDNESDAY, OCTOBER 4, 1989

U.S. SENATE,
COMMITTEE ON COMMERCE, SCIENCE, AND TRANSPORTATION,
SUBCOMMITTEE ON THE CONSUMER,
*Washington, DC.*

The subcommittee met, pursuant to notice, at 9:34 a.m., in room SR-253, Russell Senate Office Building, Hon. Richard Bryan (chairman of the subcommittee) presiding.

Staff members assigned to this hearing: Linda Lance and Kevin Curtin, staff counsels; and Sherman Joyce, minority staff counsel.

## OPENING STATEMENT BY SENATOR BRYAN

Senator BRYAN. Good morning. I would like to take this opportunity to welcome you to this hearing of the Consumer Subcommittee on S. 583, the National Plumbing Products Efficiency Act of 1989. We are holding this hearing at the request of Senator Wyche Fowler, the author of the bill, who joins us this morning to testify.

The purpose of this bill is the important goal of conserving water, certainly a precious resource. The bill would impose federal water use and labeling standards on various plumbing products, products which are of obvious importance to the health and safety of all of us.

This issue is a new one before this subcommittee, and a new approach to water conservation instituted at the federal level. We will hear testimony this morning about the effects of imposing such standards by the federal government. We will hear from witnesses who are experts on environmental issues, as well as plumbing technology.

I am sure these witnesses can provide information necessary to a careful analysis of the issues presented, and we appreciate their time and assistance to the committee in the consideration of this important legislation.

Due to the limited time available, I would like to ask each of the witnesses to limit their presentation to five minutes. Their written statements will be made a part of the record in their entirety.

Senator Gorton, do you wish to make a statement?

## OPENING STATEMENT BY SENATOR GORTON

Senator GORTON. Mr. Chairman, thank you for scheduling this hearing on the Plumbing Products Efficiency Act. I want to welcome my friend and colleague Senator Fowler, the sponsor of the

bill, to our hearing this morning. We are happy that you are abie to be with us.

Water conservation is certainly an appropriate purpose for federal legislation. Agriculture, industry and residential homes each have distinct water needs. This bill attempts to conserve residential water use through the enactment of federal standards for plumbing products.

Probably most people in the United States do not associate Puget Sound with arid conditions, but in two of the last three summers, we experienced severe droughts and mandatory water restrictions were enacted. These conditions focused our state's attention on water supply issues. While Washington is blessed with many rivers and streams from the mountains, blocking these waters with dams for water storage comes only with a high price tag adversely affecting fish and wildlife. Our state concluded that conservation should be our first means of addressing water supply issues and earlier this year, our state legislature enacted a measure which adopted many of the same standards for plumbing products which are contained in this bill.

I recognize that there are some provisions in Senator Fowler's bill which were not contained in our Washington legislation and I recognize that there are legitimate concerns of other states that the federal government should not override their laws, or local building codes. I look forward to the witnesses testimony and hearing how they perceive the water conservation requirements in the bill would work on a national level.

Senator BRYAN. Thank you Senator Gorton.

I have a statement that Senator Kasten would like to have included in the record.

[The statement and bill follow:]

OPENING STATEMENT BY SENATOR KASTEN

Mr. Chairman, today's hearing on S. 583 will help to outline the bennefits that the sponsors of this legislation hope to achieve, and the concerns of the plumbing industry and some others as to possible problems that could result from reduced flow requirements in fixtures and appliances.

Because of concerns about this legislation, earlier this year I was joined in a request to CRS for a study on this subject by Senators Fowler, Roth, and Sanford. This study was a comprehensive review of the issues involved, but today we will be focused on the actual proposal of Senator Fowler and our witnesses' appraisals of S. 1277.

There is no real argument as to the fact that water resources in this country demand conservation. In certain areas this need is already acute, while in other areas the situation is not so severe. Also, I think it is important to note that the industry is moving toward more efficient products under pressure of local codes, their own standards, and consumer demand.

I think it is important, with the concerns about the operations of different infrastructure systems in areas with different conservation needs, that state and local governments be able to have the flexibility to address water efficiency requirements as best suits their particular needs. Though federal standards sometimes bring coherence to a patchwork system of regulation, I am not sure that is required here.

I look forward to the testimony today, particularly as to how such federally mandated standards might affect the working of the plumbing infrastructure we have in place. Thank you, Mr. Chairman.

101ST CONGRESS
1ST SESSION

# S. 583

To establish national standards for the manufacture and labeling of certain plumbing products in order to conserve and protect water resources, and for other purposes.

---

IN THE SENATE OF THE UNITED STATES

MARCH 15 (legislative day, JANUARY 3), 1989

Mr. FOWLER (for himself, Mr. HEINZ, Mr. CRANSTON, Mr. KERRY, Mr. ADAMS, Mr. DODD, Mr. CONRAD, Mr. MATSUNAGA, Mr. LIEBERMAN, Mr. DASCHLE, Mr. PELL, and Mr. WIRTH) introduced the following bill; which was read twice and referred to the Committee on Commerce, Science, and Transportation

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# A BILL

To establish national standards for the manufacture and labeling of certain plumbing products in order to conserve and protect water resources, and for other purposes.

*Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,*

**SECTION 1. SHORT TITLE.**

This Act may be cited as the "National Plumbing Products Efficiency Act of 1989".

**SEC. 2. FINDINGS.**

The Congress finds that—

(1) an adequate supply of clean drinking water is a precious and essential resource upon which all life and human affairs depend,

(2) the average annual per capita consumption of potable water due to indoor, water-using activities in the United States exceeds 18,000 gallons,

(3) the demand for clean water supplies continues to increase despite the limitations of availability and affordability of such supplies,

(4) substantial Federal financial investment has been made in water supply and wastewater treatment,

(5) the development of new water supplies may carry substantial economic and environmental costs,

(6) technology is commercially available to improve the water efficiency of plumbing products,

(7) technology is commercially available to improve both the water efficiency and energy efficiency of clothes washers and dishwashers,

(8) the consensus standards developed voluntarily by United States manufacturers of plumbing products, including standards for water use, reflect the practicality of setting standards for such products and the need to save water, but such consensus standards have not kept pace with technological change or national water needs and are not uniformly enforced,

(9) some local jurisdictions have exercised regulatory authority to improve water use efficiency standards for some plumbing fixtures, but there are no uniform national standards to ensure that plumbing products are efficient and reliable so as to facilitate predictable and permanent improvements in the efficiency of water use in all jurisdictions, and

(10) there exists a need for improved data on water use in the residential, commercial, industrial, and recreational sectors.

**SEC. 3. PURPOSES.**

The purposes of this Act are as follows:

(1) To promote greater efficiency in residential and commercial water use and preserve the natural resources of the United States.

(2) To reduce consumer water and energy costs by reducing indoor water use, reducing the need for new water supplies and treatment facilities, lowering operation and maintenance costs for water and sewer utilities, and reducing the amount of energy used to heat, treat, and transport water.

(3) To facilitate interstate commerce and maintain an orderly market for certain plumbing products.

(4) To generate consumer awareness of the need to save water and of the water and money that can be saved by purchasing efficient plumbing products.

(5) To increase the competitiveness in foreign markets of plumbing products manufactured in the United States.

(6) To develop a national data base on residential, commercial, industrial, and recreational water use.

# TITLE I—WATER USE STANDARDS FOR PLUMBING PRODUCTS

## SEC. 101. COVERAGE.

(a) IN GENERAL.—The following plumbing products are subject to this title:

(1) Water closets, including gravity tank-type toilets, flushometer-tank toilets, flushometer-valve toilets, electromechanical hydraulic toilets, and all other types of toilets that use water.

(2) Urinals.

(3) Showerheads.

(4) Faucets (lavatory and kitchen).

(5) Any other type of plumbing product which the Secretary classifies as a covered product under subsection (b). Such products may include drinking fountains, water cooled air conditioning systems (and associated cooling equipment), and decorative fountains.

(b) ADDITIONAL CLASSIFICATION OF COVERED PRODUCTS.—The Secretary may classify other plumbing products as covered products if the Secretary determines such classification is necessary or appropriate.

**SEC. 102. TEST PROCEDURES.**

(a) IN GENERAL.—

(1) The Secretary shall prescribe a test procedure for a product classified as a covered product, at least 180 days before the effective date of the water use standard prescribed for such covered product under section 103(a).

(2) A test procedure prescribed under paragraph (1) shall be designed to produce test results which measure the water use and estimated annual operating cost of a covered product during a representative average use cycle or period of use.

(3) A test procedure for determining the estimated annual operating cost of a covered product shall provide that such costs shall be calculated from measurements of the water use of such product on an average per cycle basis or on an average annual use basis (as determined by the Secretary) and from representative average unit costs of the water needed to operate such product during such cycle or annual use. The Secretary shall provide information to manufacturers with respect

to representative average unit costs of water and sewer services.

(4) Before prescribing any final test procedure under paragraph (1), the Secretary shall—

(A) publish a proposed test procedure in the Federal Register, and

(B) afford interested persons an opportunity (of not less than 45 days or more than 90 days duration) to present oral and written data, views, and arguments on the proposed test procedure.

(b) REEVALUATION OF TEST PROCEDURES.—

(1) The Secretary shall, not later than 3 years after the date of prescribing a test procedure under subsection (a) (and from time to time thereafter), conduct a reevaluation of such procedure and, on the basis of such reevaluation, determine if such test procedure should be amended. In conducting such reevaluation, the Secretary shall take into account such information as the Secretary considers relevant, including technological developments relating to the water use or water efficiency of the covered products involved.

(2) If the Secretary determines under paragraph (1) that a test procedure should be amended, the Secretary shall promptly publish in the Federal Register a proposed test procedure incorporating such amend-

ments and afford interested persons an opportunity to present oral and written data, views, and arguments. Such comment period shall not be less than 45 days or more than 90 days.

(c) CASE IN WHICH TEST PROCEDURE NOT REQUIRED.—The Secretary is not required to publish or prescribe a test procedure for a covered product, if the Secretary determines, by rule, that a test procedure cannot be developed which produces results of the type described in subsection (a)(2) and publishes such determination in the Federal Register, together with the reasons therefor.

(d) RESTRICTION ON CERTAIN REPRESENTATIONS.—

(1) Effective 180 days after a test procedure applicable to a covered product is prescribed under subsection (a), no manufacturer, distributor, retailer, or private labeler may make any representation—

(A) in writing (including a representation on a label), or

(B) in any broadcast advertisement,

with respect to the water use of a covered product to which a test procedure is applicable under subsection (a) or the cost of water consumed by such product, unless such product has been tested in accordance with such test procedure and such representation fairly discloses the result of such testing.

(2) On the petition of any manufacturer, distributor, retailer, or private labeler, filed not later than 60 days before the expiration of the period involved, the 180-day period referred to in paragraph (1) may be extended by the Secretary with respect to the petitioner (but in no event for more than an additional 180 days) if the Secretary finds that the requirements of paragraph (1) would impose on such petitioner undue hardship (as determined by the Secretary).

**SEC. 103. WATER USE STANDARDS FOR COVERED PRODUCTS.**

(a) IN GENERAL.—The Secretary shall, subject to the maximum rates of water use established for certain plumbing products under subsection (b) and in accordance with subsection (c), prescribe water use standards for each product classified as a covered product. Such standards shall be designed to achieve the maximum efficiency of water use which the Secretary determines is technologically feasible and economically justified.

(b) MAXIMUM WATER USE OF CERTAIN PLUMBING PRODUCTS.—

(1) STANDARDS FOR WATER CLOSETS.—The maximum water use allowed in gallons per flush (gpf) for any of the following water closets, manufactured and sold on or after January 1, 1992, is the following:

| | |
|---|---|
| Gravity tank-type toilets | 1.6 gpf. |
| Flushometer-valve toilets | 1.6 gpf. |
| Flushometer-tank toilets | 1.6 gpf. |

| | |
|---|---|
| Electromechanical hydraulic toilets | 1.6 gpf. |

(2) STANDARD FOR URINALS.—The maximum water use allowed for any urinal, manufactured and sold on or after January 1, 1991, is 1.0 gallons per flush.

(3) STANDARD FOR SHOWERHEADS.—The maximum water use allowed for any showerhead, manufactured and sold on or after January 1, 1991, is 2.5 gallons per minute.

(4) STANDARD FOR FAUCETS.—The maximum water use allowed in gallons per minute (gpm) for any of the following faucets and replacement aerators, manufactured and sold on or after January 1, 1991, is the following:

| | |
|---|---|
| Lavatory faucets | 2.0 gpm. |
| Lavatory replacement aerators | 2.0 gpm. |
| Kitchen faucets | 2.5 gpm. |
| Kitchen replacement aerators | 2.5 gpm. |

(c) WATER USE STANDARDS FOR OTHER COVERED PRODUCTS.—The Secretary shall prescribe water use standards for any product that is classified as a covered product under section 101(b) and is manufactured and sold on or after the date that is 3 years after such product receives such classification.

(d) PROCEDURE FOR PRESCRIBING WATER USE STANDARDS.—Before prescribing any final water use standard, the Secretary shall—

(1) publish a proposed water use standard in the Federal Register, and

(2) afford interested persons an opportunity (of not less than 45 days duration) to present oral and written data, views, and arguments on the proposed water use standard.

(e) REEVALUATION OF WATER USE STANDARDS.—

(1) The Secretary shall, not later than 30 days after the expiration of each 5-year period after the date of the enactment of this title, conduct a reevaluation of the water use standards prescribed under subsection (a) and, on the basis of such reevaluation and subject to paragraph (2), determine if any such standard should be amended. In conducting such reevaluation, the Secretary shall—

(A) determine whether on the date of such reevaluation each water use standard continues to meet the requirements contained in subsection (a), taking into account such information as the Secretary considers relevant, including technological developments relating to the water use or water efficiency of the covered products involved, and

(B)(1) publish existing water use standards in the Federal Register, and

(2) afford interested persons an opportunity (of not less than 60 days or more than 120 days duration) to present oral and written data, views, and arguments.

(2) The Secretary may not prescribe any amended standard which increases the maximum allowable water use of a covered product.

(3) If the Secretary determines under paragraph (1) that a water use standard should be amended, the Secretary shall promptly publish in the Federal Register a proposed water use standard incorporating such amendment and afford interested persons an opportunity to present oral and written data, views, and arguments. Such comment period shall not be less than 45 days or more than 90 days duration.

(f) EXEMPTIONS.—The Secretary may exempt a class (or a type) of a covered product from the standards prescribed under subsection (a) when the Secretary determines that standards for a class (or a type) of a covered product are inappropriate or cannot be accommodated by existing technology. Such classes (or types) may include products used in public buildings, schools, hospitals, or correctional facilities. In such cases, the Secretary shall establish a review date for such an exemption in order to determine the necessity for a continued exemption based on existing technology.

**SEC. 104. LABELING AND MARKING REQUIREMENTS.**

(a) IN GENERAL.—The Commission shall prescribe labeling and marking rules for each product classified as a covered product, except to the extent that, with respect to such product, the Commission determines under subsection (b)(4) that labeling and marking is not technologically or economically feasible.

(b) PROCEDURE FOR PRESCRIBING RULES.—

(1) Except as provided in paragraph (4), not later than 30 days after the date on which a proposed test procedure applicable to a covered product is published under section 102(a) the Commission shall publish a proposed labeling and marking rule applicable to such product.

(2) The Commission shall afford interested persons an opportunity to present oral and written data, views, and arguments with respect to proposed labeling and marking rules. Such comment period shall not be less than 45 days or more than 90 days.

(3) A labeling and marking rule published in accordance with paragraph (1) shall take effect not later than 90 days after the date of the prescription of such rule, except that such rules may take effect not later than 180 days after the date of prescription if the Commission determines that such extension is neces-

sary to allow persons subject to such rules adequate time to come into compliance with such rules.

(4) The Commission may delay the publication of a proposed labeling and marking rule, or the prescription of a labeling and marking rule, if it determines that it cannot publish proposed labeling and marking rules or prescribe labeling and marking rules which meet the requirements of subsections (c) and (d) on or before the dates specified in paragraphs (1) and (3) and publishes such determination in the Federal Register, together with the reasons therefor. In any such case, it shall publish proposed labeling and marking rules or prescribe labeling and marking rules for covered products as soon as practicable unless it determines:

(A) that labeling and marking in accordance with subsections (c) and (d) is not economically or technically feasible, or

(B) labeling and marking in accordance with subsections (c) and (d) is not likely to assist consumers in purchasing decisions.

Any such determination shall be published in the Federal Register, together with the reasons therefor.

(c) CONTENT OF LABEL.—

(1) A rule prescribed under subsection (a) shall require that a covered product bear a label which discloses the following:

(A) The estimated annual operating cost of such product (determined in accordance with test procedures prescribed under section 102) and the year that such cost estimate was made, except that if—

(i) the Secretary determines that disclosure is not technologically feasible, or

(ii) the Commission determines that such disclosure is not likely to assist consumers in making purchasing decisions or is not economically feasible,

the Commission shall require disclosure of a different useful measure of water use (determined in accordance with test procedures prescribed under section 102).

(B) Information respecting the range of estimated annual operating costs for a covered product, except that if the Commission requires disclosure under subparagraph (A) of a measure of water use different from estimated annual operating cost, then the label shall disclose the range of

such measure of water use of such covered product to which such rule applies.

(2) A rule under subsection (a) shall include the following:

(A) A description of the covered product to which the rule applies.

(B) Subject to paragraph (6), information respecting the range of estimated annual operating costs or other useful measure of water use (determined in such manner as the rule may prescribe) for such covered product.

(C) A description of the test procedures under section 102 used in determining the estimated annual operating costs or other measure of water use of such covered product.

(D) A prototype label and directions for displaying such label.

(3) A rule under subsection (a) shall require that the label be displayed in a manner that the Commission determines is likely to assist consumers in making purchasing decisions. The Commission may permit a tag to be used in lieu of a label in any case in which the Commission finds that a tag will carry out the purposes for which the label was intended.

(4) A rule under subsection (a) applicable to a covered product may require disclosure, in any printed matter displayed or distributed at the point of sale of such product, of any information which may be required under this subsection to be disclosed on the label of such product. Requirements under this paragraph shall not apply to any broadcast advertisement or any advertisement in any newspaper, magazine, or other periodical.

(5) The Commission may require that the manufacturers of a covered product to which a rule subsection (a) applies (A) include on the label, (B) separately attach to the product, or (C) ship with the product additional information relating to water use, including instruction for the maintenance, use, or repair of the covered product, if the Commission determines that such additional information would assist consumers in making purchasing decisions or in using such product, and that such requirement would not be unduly burdensome to manufacturers.

(6) The Commission may delay the effective date of the requirement specified in paragraph (1)(B) applicable to a covered product, insofar as it requires the disclosure on the label of information respecting the range of a measure of water use, for not more than 12

months after the date on which the rule under subsection (a) is first applicable to such type or class, if the Commission determines that such information will not be available within an adequate period of time before such date.

(d) MARKING.—A rule prescribed under subsection (a) shall further require that each component of a covered product bear a permanent marking which—

(1) can be easily located and read by consumers, and

(2) provides consumers with the following information:

(A) The manufacturer's name or registered trademark.

(B) The water use of the product as determined under section 102(a)(2).

(e) PRODUCTS COMPLETED BEFORE EFFECTIVE DATE OF RULES.—A rule under subsection (a) shall not apply to any covered product the manufacture of which was completed before the effective date of such rule.

(f) STUDY TO DETERMINE COVERAGE FOR ADDITIONAL PRODUCTS.—The Secretary, in consultation with the Commission, shall study plumbing products for which labeling and marking rules under subsection (a) have not been proposed in order to determine—

(1) the aggregate water use of such products, and

(2) whether the imposition of labeling and marking requirements would be feasible and useful to consumers in making purchasing decisions. The Secretary shall include the results of such study in the annual report under section 113.

**SEC. 105. REQUIRED TESTING AND TEST DATA.**

(a) TEST DATA RECORDS.—

(1) Test data shall be kept on file by the manufacturer for each model of a covered product for a period beginning 15 days after the prescription of a test procedure for such product under section 102 and ending 2 years after the production of that model has been terminated.

(2) Upon notification by the Secretary, a manufacturer or a private labeler shall provide, not later than 30 days after the date of such request, a report on the underlying test data from which the labeling and marking content as required by subsections (b) and (c) of section 104 for each basic model was derived.

(b) REQUIRED TESTING BY DESIGNATED LABORATORY.—Upon notification by the Secretary, a manufacturer of a covered product shall supply at the manufacturer's expense, no more than 2 of each model of each product to the Secretary for the purpose of verifying the labeling and marking

content as required by subsections (b) and (c) of section 104. Such a procedure may be required after the Secretary has examined the underlying test data provided by the manufacturer and after the manufacturer has been afforded the opportunity to reverify test results from which the estimated annual water cost or water use for each basic model was derived. A representative designated by the Secretary shall be permitted to observe any reverification procedures required by this subsection, and to inspect the results of such reverification. Charges for testing by designated laboratories will be paid by the manufacturer.

**SEC. 106. ASSISTANCE FROM NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY.**

The Secretary shall direct the National Institute of Standards and Technology—

(1) to provide such assistance as the Secretary considers necessary to carry out the Secretary's responsibilities under this title, including the development of water use standards under section 103 and test procedures under section 102, and

(2) in coordination with the United States Geological Survey, to establish and maintain a water use database for the collection and dissemination of data and information relating to water use of plumbing products in the United States.

SEC. 107. IMPORTS.

Any covered product offered for importation in violation of section 108 shall be refused admission into the customs territory of the United States under rules issued by the Secretary of the Treasury, except that the Secretary of the Treasury may, by such rules, authorize the importation of such covered product upon such terms and conditions (including the furnishing of a bond) as may appear to him appropriate to ensure that such covered product will not violate section 108 or will be exported or abandoned to the United States. The Secretary of the Treasury shall prescribe rules under this section not later than 180 days after the date of the enactment of this title.

SEC. 108. PROHIBITED ACTS.

(a) IN GENERAL.—It shall be unlawful—

(1) for any manufacturer or private labeler to distribute in commerce any new covered product which is not in conformity with an applicable water use standard prescribed under section 103,

(2) for any person to fail to comply with an applicable requirement of section 102,

(3) for any manufacturer or private labeler to distribute in commerce any new covered product to which a rule under section 104 applies, unless such covered product is labeled and marked in accordance with such rule,

(4) for any manufacturer, distributor, retailer, or private labeler to remove from any new covered product or render illegible any label or marking required to be provided with such product under a rule under section 104, or

(5) for any manufacturer to fail to permit access to, or the copying of, records required to be supplied under section 105, or fail to make reports or provide other information required to be supplied under such section.

(b) DEFINITION.—For the purposes of subsection (a), the term "new covered product" means a covered product the title of which has not passed to a purchaser who buys such product for purposes other than (1) reselling such product, or (2) leasing such product for a period in excess of one year.

**SEC. 109. ENFORCEMENT.**

(a) IN GENERAL.—Except as provided in subsection (c), any person who knowingly violates any provision of section 108(a) shall be subject to a civil penalty of not more than $100 for each violation. Such penalties shall be assessed by the Commission, except that penalties for violations of paragraphs (1) and (2) of section 108(a) shall be assessed by the Secretary. Civil penalties assessed under this subsection may be compromised by the agency or officer authorized to assess

the penalty, taking into account the nature and degree of the violation and the impact of the penalty upon a particular respondent. Each violation of section 108(a) shall constitute a separate violation with respect to each covered product, and each day of violation of paragraph (5) of section 108(a) shall constitute a separate violation.

(b) DEFINITION.—As used in subsection (a), the term "knowingly" means—

(1) the having of actual knowledge, or

(2) the presumed having of knowledge deemed to be possessed by a reasonable man who acts in the circumstances, including knowledge obtainable upon the exercise of due care.

(c) SPECIAL RULE.—It shall be an unfair or deceptive act or practice in or affecting commerce (within the meaning of section 5(a)(1) of the Federal Trade Commission Act) for any person to violate section 102(d), except to the extent that such violation is prohibited under section 108(a)(3), in which case such provisions shall apply.

(d) PROCEDURE FOR ASSESSING PENALTY.—

(1) Before issuing an order assessing a civil penalty against any person under subsection (a), the Secretary shall provide to such person notice of the proposed penalty. Such notice shall inform such person of his or her opportunity to elect in writing within 30 days after

the date of receipt of such notice to have the procedures of paragraph (3) (in lieu of those of paragraph (2)) apply with respect to such assessment.

(2)(A) Unless an election is made within 30 calendar days after receipt of notice under paragraph (1) to have paragraph (3) apply with respect to such penalty, the Secretary shall assess the penalty, by order, after a determination of violation has been made on the record after an opportunity for an agency hearing pursuant to section 554 of title 5, United States Code, before an administrative law judge appointed under section 3105 of such title. Such assessment order shall include the administrative law judge's findings and the basis for such assessment.

(B) Any person against whom a penalty is assessed under this paragraph may, within 60 calendar days after the date of the order of the Secretary assessing such penalty, institute an action in the United States court of appeals for the appropriate judicial circuit for judicial review of such order in accordance with chapter 7 of title 5, United States Code. The court shall have jurisdiction to enter a judgment affirming, modifying, or setting aside in whole or in part, the order of the Secretary, or the court may remand the

proceeding to the Secretary for such further action as the court may direct.

(3)(A) In the case of any civil penalty with respect to which the procedures of this paragraph have been elected, the Secretary shall promptly assess such penalty, by order, after the date of the receipt of the notice under paragraph (1) of the proposed penalty.

(B) If the civil penalty has not been paid within 60 calendar days after the assessment order has been made under subparagraph (A), the Secretary shall institute an action in the appropriate district court of the United States for an order affirming the assessment of the civil penalty. The court shall have authority to review de novo the law and the facts involved, and shall have jurisdiction to enter a judgment enforcing, modifying, and enforcing as so modified, or setting aside in whole or in part, such assessment.

(C) Any election to have this paragraph apply may not be revoked except with the consent of the Secretary.

(4) If any person fails to pay an assessment of a civil penalty after it has become a final and unappealable order under paragraph (2), or after the appropriate district court has entered final judgment in favor of the Secretary under paragraph (3), the Secretary shall in-

stitute an action to recover the amount of such penalty in any appropriate district court of the United States. In such action, the validity and appropriateness of such final assessment order or judgment shall not be subject to review.

(5)(A) Notwithstanding the provisions of title 28, United States Code, the Secretary shall be represented by the general counsel of the Department of Commerce (or any attorney or attorneys within the Department of Commerce designated by the Secretary) who shall supervise, conduct, and argue any civil litigation to which paragraph (3) of this subsection applies (including any related collection action under paragraph (4)) in a court of the United States or in any other court, except the Supreme Court. However, the Secretary or the general counsel shall consult with the Attorney General concerning such litigation, and the Attorney General shall provide, on request, such assistance in the conduct of such litigation as may be appropriate.

(B) The Secretary shall be represented by the Attorney General, or the Solicitor General, as appropriate, in actions under this subsection, except to the extent provided in subparagraph (A) of this paragraph.

(6) For the purposes of applying paragraphs (1) through (5) of this subsection in the case of the assess-

ment of a penalty by the Commission under subsection (a), references to "Secretary" and "Department of Commerce" shall be considered references to the "Commission".

**SEC. 110. CITIZEN SUITS.**

(a) IN GENERAL.—Except as otherwise provided in subsection (b), any person may commence a civil action against—

(1) any manufacturer or private labeler who is alleged to be in violation of any provision of this title or any rule under this title,

(2) any Federal agency which has a responsibility under this title where there is an alleged failure of such agency to perform any act or duty under this title which is not discretionary, or

(3) the Secretary in any case in which there is an alleged failure of the Secretary to comply with any nondiscretionary duty to issue a proposed or final rule.

The United States district courts shall have jurisdiction, without regard to the amount in controversy or the citizenship of the parties, to enforce such provision or rule, or order such Federal agency to perform such act or duty, as the case may be. The courts shall advance on the docket, and expedite the disposition of, all cases filed therein pursuant to paragraph (3). If the court finds that the Secretary has failed to

comply with a deadline established in section 103, the court shall have jurisdiction to order appropriate relief, including relief that will ensure the Secretary's compliance with future deadlines for the same covered product.

(b) LIMITATION.—No action may be commenced—

(1) under subsection (a)(1)—

(A) prior to 60 days after the date on which the plaintiff has given notice of the violation (i) to the Secretary, (ii) to the Commission, and (iii) to any alleged violator of such provision or rule, or

(B) if the Commission has commenced and is diligently prosecuting a civil action to require compliance with such provision or rule, but, in any such action, any person may intervene as a matter of right,

(2) under subsection (a)(2) prior to 60 days after the date on which the plaintiff has given notice of such action to the Secretary.

(c) RIGHT TO INTERVENE.—In such action under subsection (a), the Secretary or the Commission (or both), if not a party, may intervene as a matter of right.

(d) AWARD OF COSTS OF LITIGATION.—The court, in issuing any final order in any action brought pursuant to subsection (a), may award costs of litigation (including reasona-

ble attorney and expert witness fees) to any party, whenever the court determines such award is appropriate.

(e) PRESERVATION OF OTHER RELIEF.—Nothing in this section shall restrict any right which any person (or class of persons) may have under any statute or common law to seek enforcement of this title or any rule thereunder, or to seek any other relief (including relief against the Secretary or the Commission).

(f) COMPLIANCE IN GOOD FAITH.—For the purposes of this section, if a manufacturer or private labeler complied in good faith with a rule under this title, then he shall not be deemed to have violated any provision of this title by reason of the alleged invalidity of such rule.

**SEC. 111. EFFECT ON STATE LAW.**

(a) PREEMPTION.—Except as provided in subsection (b), a standard, procedure, or rule under this title shall supersede any State regulation or river basin commission regulation insofar as such regulation provides for—

(1) any water use standard or other requirement with respect to the water use of a covered product if—

(A) there is a standard in effect under section 103 applicable to such product and such regulation is not identical to such standard, or

(B) there is a rule in effect under section 102 applicable to such product and such regulation re-

quires testing in accordance with test procedures which are not identical to the test procedures specified in such rule, or

(2) the disclosure of information with respect to any measure of water use of any covered product if—

(A) there is a rule in effect under section 102 applicable to such product, and such regulation requires testing in any manner other than that prescribed in such rule under section 102, or

(B) there is a rule in effect under section 104 applicable to such product, and such regulation requires disclosure of information other than information disclosed in accordance with such rule under section 104.

(b) WAIVER OF FEDERAL PREEMPTION.—(1)(A) Any State or river basin commission with a regulation which provides for any water use standard or other requirement with respect to water use or water efficiency for any covered product for which there is a Federal water use standard under section 103 may file a petition with the Secretary requesting a rule that such regulation become effective with respect to such covered product.

(B) Subject to paragraphs (2) through (5), the Secretary shall, within the period described in paragraph (2) and after consideration of the petition and the comments of interested

persons, prescribe such rule if the Secretary finds (and publishes such finding) that the State or river basin commission has established by a preponderance of the evidence that such regulation is needed to meet unusual and compelling State, regional, or local water interests.

(C) For purposes of this subsection, the term "unusual and compelling State, regional, or local water interests" means interests which—

(i) are substantially different in nature or magnitude than those prevailing in the United States generally, and

(ii) are such that the costs, benefits, burdens, and reliability of water savings resulting from the State regulation or river basin commission regulation make such regulation preferable or necessary when measured against the costs, benefits, burdens, and reliability of alternative approaches to water savings, including reliance on reasonably predictable market-induced improvements in efficiency of all products subject to such regulation.

The factors described in clause (ii) shall be evaluated within the context of the water supply and groundwater management plan, water quality program, and comprehensive plan (where one exists) of the State or river basin commission for

improving, developing, or conserving a waterway affected by water supply development.

(2) The Secretary shall give notice of any petition filed under paragraph (1)(A) and afford interested persons a reasonable opportunity to make written comments, including rebuttal comments, thereon. The Secretary shall, within the 6-month period beginning on the date on which any such petition is filed, deny such petition or prescribe the requested rule, except that the Secretary may publish a notice in the Federal Register extending such period to a date certain but no longer than 1 year after the date on which the petition was filed. Such notice shall include the reasons for delay. In the case of any denial of a petition under this subsection, the Secretary shall publish in the Federal Register notice of, and the reasons for such denial.

(3) The Secretary may not prescribe a rule under this subsection if the Secretary finds (and publishes such finding) that interested persons have established, by a preponderance of the evidence, that such State regulation or river basin commission regulation will significantly burden manufacturing, marketing, distribution, sale, or servicing of the covered product on a national basis. In determining whether to make such finding, the Secretary shall evaluate all relevant factors, including—

(A) the extent to which the State regulation or river basin commission regulation will increase manufacturing or distribution costs of manufacturers, distributors, and others,

(B) the extent to which the State regulation or river basin commission regulation will disadvantage smaller manufacturers, distributors, or dealers or lessen competition in the sale of the covered product in the State or region subject to the regulation, and

(C) the extent to which the State regulation or river basin commission regulation would cause a burden to manufacturers to redesign and produce the covered product, taking into consideration the extent to which the regulation would result in a reduction—

(i) in the current models, or in the projected availability of models, that could be shipped on the effective date of the regulation to the State or region subject to the regulation and within the United States, or

(ii) in the current or projected sales volume of the covered product in the State or region subject to the regulation and the United States.

(4) The Secretary may not prescribe a rule under this subsection if the Secretary finds (and publishes such finding) that interested persons have established, by a preponderance

of the evidence, that the State regulation or river basin commission regulation is likely to result in the unavailability in the State or region subject to the regulation and the United States of any covered product type (or class) of performance characteristics (including reliability), features, sizes, capacities, and volumes that are substantially the same as those generally available in the State or region subject to the regulation at the time of the Secretary's finding, except that the failure of some classes (or types) to meet this criterion shall not affect the Secretary's determination of whether to prescribe a rule for other classes (or types).

(5) No final rule prescribed by the Secretary under this subsection may—

(A) permit any State regulation or river basin commission regulation to become effective with respect to any covered product manufactured within 3 years after such rule is published in the Federal Register or within 5 years if the Secretary finds that such additional time is necessary due to the substantial burdens of retooling, redesign, or distribution needed to comply with the State regulation or river basin commission regulation, or

(B) become effective with respect to a covered product manufactured before the earliest possible effective date specified in section 103 for the initial amend-

ment of the water use standard established in such section for the covered product, except that such rule may become effective before such date if the Secretary finds (and publishes such finding) that, in addition to the other requirements of this subsection the State or river basin commission has established, by a preponderance of the evidence, that—

(i) a water emergency condition exists within the State or region subject to the regulation which—

(I) imperils the health, safety, and welfare of its residents because of the inability of such State or region to provide adequate quantities of water to its residents at less than prohibitive costs, and

(II) cannot be substantially alleviated by the importation of water or the use of interconnection agreements, and

(ii) the State regulation or river basin commission regulation is necessary to alleviate substantially such condition.

(6) In any case in which a State or river basin commission is issued a rule under paragraph (1) with respect to a covered product and subsequently a Federal water use standard concerning such product is amended pursuant to section

103(e), any person subject to such State regulation or water basin commission regulation may file a petition with the Secretary requesting the Secretary to withdraw the rule issued under paragraph (1) with respect to such product in such State or region. The Secretary shall consider such petition in accordance with the requirements of paragraphs (1), (3), and (4), except that the burden shall be on the petitioner to show by a preponderance of the evidence that the rule received by the State or river basin commission under paragraph (1) should be withdrawn as a result of the amendment to the Federal standard. If the Secretary determines that the petitioner has shown that the rule issued by the State or river basin commission should be so withdrawn, the Secretary shall withdraw it.

(c) EXCEPTION FOR CERTAIN STATE PROCUREMENT STANDARDS.—Any State regulation which sets forth procurement standards for a State (or political subdivision thereof) shall not be superseded by the provisions of this part if such standards are more stringent than the corresponding Federal water use standards.

**SEC. 112. ADVISORY COMMITTEE.**

The Secretary shall establish an advisory committee which shall report annually to Congress on the implementation of this title by the Secretary and the Commission. The members of such advisory committee shall include represent-

atives of the manufacturers, distributors, and installers of plumbing products, representatives of water supply and wastewater treatment agencies, and representatives of environmental, consumer protection, and engineering organizations and professional societies and shall be appointed to such terms as the Secretary considers appropriate. Such advisory committee shall be subject to the requirements of the Federal Advisory Committee Act (5 U.S.C. App.).

**SEC. 113. ANNUAL REPORT.**

The Secretary shall report to Congress and the President either (1) as part of his annual report, or (2) in a separate report submitted annually, on the progress of the program undertaken pursuant to this title and on the water use impact of this title. Each such report shall specify the actions undertaken by the Secretary in carrying out this title during the period covered by such report, and those actions which the Secretary was required to take under this title during such period but which were not taken, together with the reasons thereof.

**SEC. 114. DEFINITIONS.**

For the purposes of this title:

(1) The term "commerce" means trade, traffic, commerce, or transportation—

(A) between a place in a State and any place outside thereof, or

(B) which affects trade, traffic, commerce, or transportation between a place in a State and any place outside thereof.

(2) The term "Commission" means the Federal Trade Commission.

(3) The term "covered product" means a product which under section 101(a) is subject to this title.

(4) The term "Department" means the Department of Commerce.

(5) The term "distributor" means a person (other than a manufacturer or retailer) to whom a consumer product is delivered or sold for purposes of distribution in commerce.

(6) The terms "to distribute in commerce" and "distribution in commerce" mean to sell in commerce, to import, to introduce or deliver for introduction into commerce, or to hold for sale or distribution after introduction into commerce.

(7) The term "estimated annual operating cost" means the national average aggregate retail cost of the water which is likely to be consumed annually in the representative use of a plumbing product, determined in accordance with section 102.

(8) The terms "import" and "importation" means to import into the customs territory of the United States.

(9) The term "manufacture" means to manufacture, produce, assemble, or import.

(10) The term "person" includes (A) any individual, (B) any corporation, company, association, firm, partnership, society, trust, joint venture, or joint stock company, and (C) the government and any agency of the United States or any State or political subdivision thereof.

(11)(A) The term "private labeler" means an owner of a brand or trademark on the label of a plumbing product which bears a private label, and

(B) A plumbing product bears a private label if—

(i) such product (or its container) is labeled with the brand or trademark of a person other than a manufacturer of such product.

(ii) the person with whose brand or trademark or a manufacturer of such product does not appear on such label.

(12) The term "plumbing product" means any product of a type which in operation consumes, transports, or uses water.

(13) The term "retailer" means a person to whom a plumbing product is delivered or sold, if such delivery or sale is for purposes of sale or distribution in commerce to purchasers who buy such product for purposes other than resale.

(14) The term "Secretary" means the Secretary of the Department of Commerce.

(15) The term "State" means a State, the District of Columbia, Puerto Rico, or any territory or possession of the United States, or political subdivision thereof.

(16) The term "State regulation" means a law or regulation of a State or political subdivision thereof.

(17) The term "river basin commission" means a commission established under section 201(a) of the Water Resources Planning Act (42 U.S.C. 1962b(a)).

(18) The term "water use standard" means a performance standard which prescribes a maximum quantity of water use for a covered product, determined in accordance with test procedures prescribed under section 102.

(19) The term "water use" means the quantity of water used or consumed by a plumbing product at point of use, determined in accordance with test procedures under section 102.

SEC. 115. AUTHORIZATION FOR APPROPRIATIONS.

There are authorized to be appropriated to carry out this title:

(1) $1,000,000 for fiscal year 1990.

(2) $2,000,000 for fiscal year 1991.

(3) $2,000,000 for fiscal year 1992.

(4) $1,500,000 for fiscal year 1993.

(5) $1,500,000 for fiscal year 1994.

# TITLE II—WATER USE STANDARDS FOR DISHWASHERS AND CLOTHES WASHERS

SEC. 201. AMENDMENTS TO ENERGY POLICY AND CONSERVATION ACT.

(a) STATEMENT OF PURPOSE.—Section 2 of the Energy Policy and Conservation Act (42 U.S.C. 6201) is amended—

(1) by striking out "and" at the end of paragraph (6),

(2) by striking out the period at the end of paragraph (7) and inserting in lieu thereof "; and", and

(3) by adding at the end the following new paragraph:

"(8) to conserve water supplies by improving the water efficiency of dishwashers and clothes washers.".

(b) DEFINITIONS.—Section 321(a) of such Act (42 U.S.C. 6291(a)) is amended—

(1) in paragraph (7), by inserting ", and in the case of dishwashers and clothes washers the aggregate retail cost of the water," after "cost of the energy", and

(2) by adding at the end the following new paragraph:

"(30) The term 'total water use' means the quantity of water directly consumed by a dishwasher or clothes washer at point of use, determined in accordance with test procedures under section 323.".

(c) TEST PROCEDURES.—Section 323(b)(3) of such Act (42 U.S.C. 6293(b)(3)) is amended by striking out "or estimated annual operating cost" and inserting in lieu thereof "estimated annual operating cost, or total water use,".

(d) STANDARDS.—Section 325(g)(4)(A) of such Act (42 U.S.C. 6295(g)(4)(A)) is amended—

(1) by inserting "and to establish standards for total water use by dishwashers and clothes washers" before the period at the end of the first sentence, and

(2) by inserting "or water use standard" after "any amendment".

Senator BRYAN. This morning I am pleased to see that we are joined by our colleague, the distinguished junior Senator from the State of Georgia and the author of this bill, Senator Wyche Fowler. Good morning, Senator Fowler.

## STATEMENT OF HON. WYCHE FOWLER, U.S. SENATOR FROM GEORGIA

Senator FOWLER. Good morning, Mr. Chairman. Thank you for your kind words.

I am pleased to be joined by my colleague, my former colleague from the House of Representatives and of course our colleague in the Congress, Chet Atkins from Massachusetts, who is the author and leader on behalf of this effort in the House of Representatives.

Mr. Chairman, I have a complete statement, if I may put that in the record, and then I will hold my remarks to the appropriate five minutes.

First of all, I thank you and the committee for agreeing to hold these hearings on what we call the Plumbing Products Efficiency Act. This legislation would set national water efficiency standards for the manufacture and labeling of plumbing products sold in interstate commerce.

Mr. Chairman, I come from a region of the country more blessed with water resources than any other. The South is a land of rivers and wetlands, lakes and underground aquifers. In this decade, however, drought and the demands of growth are putting increasing strains on even our water supplies.

Rivalry for scarce water resources is building among competing municipalities and classes of users. The city of Atlanta, for instance, does not expect to be able to meet its water needs for more than 15 years without major public works, meaning major public expenditures, or some form of reallocations.

Officials from small towns in Georgia, and we have got plenty of those, in the southern part of the state tell me that one of the things that they need most is more money, more funding for wastewater treatment plants.

Up in the north part of my state, where we had a lot of town meetings this summer, citizens were in near revolt over low lake levels.

Now, these sound like local political problems, but I would submit that there are no satisfactory local political solutions. Rivers and underground aquifers do not respect political subdivisions. They run over, through, and under all imaginary boundaries.

We cannot legislate, negotiate, or compromise away this simple fact. In a day when increasingly one jurisdiction can only take water or treat water at the expense of another, there is only one real solution, and that is more efficient use of our water resources.

That is the approach that Representative Atkins and I have taken by putting a stop to the massive waste, or trying to put a stop to the massive waste of water in faucets, showerheads, water closets, which use much more water than is necessary to get the job done.

Our bill also addresses the issue at the level where it makes the most sense, at the source, with the manufacture of plumbing fixtures.

National standards would prevent a hodge-podge of standards from state to state and city to city that can only create a marketing nightmare for everybody and are in any case almost impossible to enforce at the level of the local building inspector.

The alternative proposed by our critics of these efforts is to simply stick with the status quo. But the status quo will not do it. Why? The U.S. Geological Survey estimates a 31 percent increase in demand on water utilities from 1975 to the end of the century.

I can tell you that building moratoria are already commonplace, for instance around the Atlanta metropolitan area. In some communities the complete depletion of groundwater supplies could result in economic disaster.

What is the answer, according to "Business as Usual?" It is estimated that taxpayers and consumers in more than 170 urban areas in all parts of the country will be required to finance at tremendous costs, billions of dollars, as we know, on more projects to increase water supply in the 1990's.

Nationwide, states and municipalities face an estimated $83 billion in necessary sewage treatment costs alone as a result of existing requirements and needs.

I have many other facts, Mr. Chairman, but I ask unanimous consent to present my full statement in the record.

In conclusion in just 30 seconds, let me say that I am very appreciative of the industry people who are here and who have agreed to testify so we can discuss the various issues surrounding my bill. I am an old-fashioned politician in one sense, and that is, different from most of my colleagues and most of the staff, I do not believe in polls. I try everything I can do to keep from reading any polls, and I will not bore you with the reasons. But I have taken a three-person poll over the last year and a half on my bill.

One was a plumber who was sitting next to me on a bus and of course, thankfully, did not know who I was. One was a plumber sitting next to me at a Braves-Montreal baseball game in August. And one was a plumber standing next to me waiting to get to see "When Harry Met Sally."

I said, I am just Joe Sixpack here; I have heard, I have read about these new showerheads and toilets that you can save some water with; what has been your experience? Do they work?

And all three said they work great; they will save you a lot of money and you would be smart to install them.

Thank you, Mr. Chairman.

[The statement follows:]

**Plumbing Products Efficiency Act**
**Senator Wyche Fowler, Jr.**
**October 5, 1989**

I want to thank the Chairman and the Subcommittee for agreeing to hold hearings on the Plumbing Products Efficiency Act. This legislation would set national water efficiency standards for the manufacture and labelling of plumbing products sold in interstate commerce.

Mr. Chairman, I come from a region of the country more blessed with water resources than any other. The South is a land of rivers and wetlands, lakes and underground aquifers. In this decade, however, drought and the demands of growth are putting an increasing strain on water supplies. Rivalry for scarce water resources is building among competing municipalities and classes of users. The City of Atlanta does not expect to be able to meet its water needs for more than 15 years without major public works or reallocations. Officials from small towns in South Georgia tell me that one of the things they need most is funding for wastewater treatment plants. This summer I attended town meetings in North Georgia where the citizens were in near revolt over low lake levels.

These are local political problems, but I would submit that there are no satisfactory local political solutions. Rivers and underground aquifers do not respect political subdivisions. They run over, through and under all our imaginary boundaries. We cannot legislate, negotiate or compromise away this simple truth.

In a day when, increasingly, one jurisdiction can only take water or treat water at the expense of another, there is only one real solution: more efficient use of our water resources. That is the approach Representative Atkins and I have taken, by putting a stop to the massive waste of water in faucets, water closets, showerheads -- which use much more water than is necessary to get the job done.

Our bill also addresses the issue at the level where it makes the most sense -- at the source, with the manufacturers of plumbing fixtures. National standards will prevent a hodge-podge of standards from state to state and city to city that can only create a marketing nightmare for everyone and that are, in any case, almost impossible to enforce at the level of the local building inspector.

The alternative proposed by the critics of my efforts, and those of Representative Atkins, is to stick with the status quo. But let's look at what the status quo has to offer.

The U.S. Geological Survey estimates a 31 percent increase in demand on water utilities from 1975 to the end of the century, surpassing economically available supplies in many areas and constraining economic growth. I can tell you that building moratoria are already commonplace around the Atlanta metropolitan area. In some communities, the complete depletion of groundwater supplies could result in economic disaster.

What is the answer, according to business as usual? It is estimated that taxpayers and consumers in more than 170 urban areas in all parts of the country will be required to finance -- at tremendous cost, billions of dollars -- projects to increase water supply in the 1990s. Nationwide, states and municipalities face an estimated $83,500,000,000 in necessary sewage treatment costs, as a result of existing requirements and needs.

While this legislation will not completely erase the need for all these expenditures, it will clearly save billions of dollars in public works costs over the next few decades, at an estimated cost to the federal government of $1.5 million per year. There are few areas in which the taxpayers can invest so little and receive so much relief.

Besides, we can build all the dams and aqueducts and treatment plants we want to or think we can afford, but what Will Rogers said about land is still true of water, as well: "They ain't making any more of it."

The objections about performance of efficient water products are a red herring. These products already exist. They are proven to work. States and municipalities from New York to California are already adopting the standards Representative Atkins and I have proposed -- though on a piecemeal basis which will not benefit manufacturers or consumers. Products that meet these standards have already been in use for 20 years in other countries which have never been able to afford our illusions of largesse.

This country is so large and has enjoyed such vast resources that efficiency in the use of those resources has never been a prime consideration. But it is time to bring the days of the ten gallon hat to a close. We need careful stewardship of our funding sources and our water supplies.

We need national leadership to develop and instill a strong conservation ethic in our citizens. Few incentives currently exist for manufacturers to educate consumers about the water use of their plumbing fixtures. This legislation calls for labelling of plumbing products, to encourage consumers to consider water efficiency in their purchasing decisions.

This is similar to what we have already done successfully with the National Appliance Energy Conservation Act. As with our bill, opponents of the Appliance Energy Program said it wouldn't work -- that national energy efficiency standards for home appliances would unduly burden manufacturers and wouldn't put a dent in our energy use. Well, millions of dollars in consumer savings with no sacrifices in lifestyle, together with substantial reductions is household energy use have proven them wrong. We now have the opportunity to realize the same painless savings in residential and commercial water use.

I understand that water efficiency in the home is only a small part of the equation, that residential customers account for only a fraction of our water use. That is why I have introduced this bill in conjunction with the Municipal and Industrial Water Conservation Act. However, the savings that can be achieved in American homes is far from negligible. If we could replace all our toilets, showerheads and faucets with more efficient models next year, the country's daily water consumption would be reduced by 15 percent, or almost seven billion gallons per day.

For all these reasons I think we need to establish standards for the manufacturing and labeling of plumbing products to conserve and protect our ever more precious water resources.

We have an opportunity here to provide a vision for the future welfare of our country -- to do what we constantly profess in Congress but seldom accomplish. And we don't need Nostradamus to supply that vision. We only have to acknowledge what is already plain to see and what is already happening.

From one end of this country to the other -- in water allocation wars, in local water efficiency legislation, in controversies over the billions of tax dollars spent on water treatment and supply, and over the massive environmental damage of these public works projects -- the public is crying out for more efficient use of our water resources.

Senator BRYAN. Senator Fowler, we appreciate your leadership on water conservation and sharing with us your insight, particularly on this revealing poll that you have made available to us this morning.

Senator FOWLER. It is just as good as any other you will find.

Senator BRYAN. We are also pleased this morning to have Congressman Chet Atkins with us from Massachusetts, who has introduced legislation similar to S. 583 in the House. Congressman, welcome to the committee.

## STATEMENT OF HON. CHET ATKINS, U.S. REPRESENTATIVE FROM MASSACHUSETTS

Mr. ATKINS. Thank you, Mr. Chairman, and I will submit my full statement for the record if I might.

Mr. Chairman, if I might note that I have not had the opportunity to plumb the depths of public opinion the way my colleague has, but I have worked for some period of time on this legislation with him, and I thank Senator Fowler particularly for all of his hard work and leadership on the issue of water conservation.

I also want to thank you for extending the invitation to testify on this matter and for your decision to hold hearings on S. 583. I think that this is an important part of bringing to national consciousness the issues of water supply and water costs.

Mr. Chairman, when the oil shocks of the 1970's caused prices to skyrocket and mammoth gasoline lines to form, the federal government responded with a minimal package of regulations and a small investment in energy conservation. The result of that program was really phenomenal. Over the past 15 years, those small federal actions have led to reduced energy consumption in this country of over one-third and have led to a savings to American consumers of $160 billion per year. I think it is quite clear that had we not taken those actions in the seventies, our economy today would be an absolute catastrophe, if we were paying the additional one-third cost for energy, and our standard of living would be substantially lower than what it is today.

I believe that we have the same ability today to achieve those same kind of results for water, and the need to save water today is as urgent as the need to save energy was in the 1970's. According to the U.S. Geological Survey, between 1950 and 1985 American water use increased from 180 billion gallons per day to 400 billion gallons per day. We almost doubled on a per capita basis. We came just short of doubling our per capita consumption.

Indeed, if you compare us with other industrialized nations with a similar standard of living, whether it is Japan, France, Switzerland, the United Kingdom, our average residential per capita water usage is almost double that of any other industrialized nation.

We have the same kind of problems with gluttony in our consumption of water that we did in our consumption of energy in the seventies.

While water shortages around this country were once common only in the Southwest, they now extend from coast to coast. Both the metropolitan Boston area and New York State were forced to declare water emergencies last spring, and the Congressional

Budget Office recently estimated that close to 150 of the nation's 756 larger urban water supplies will need substantial additional capacity in the next decade.

I might add that each one of those expansions will cost hundreds of millions of dollars.

I was first alerted to the promise of plumbing product efficiency by the water officials in my home state of Massachusetts. They were facing the prospect of monumental water and sewer rate hikes from the $6.1 billion Boston harbor cleanup project.

They were also facing a rapidly increasing demand for water that had spawned a number of very difficult local debates about water diversion projects that had enormous environmental and economic effects.

As a result of that, officials in Boston, and throughout Massachusetts, imposed new standards in the building code, lowering the previous 3.5 gallons per flush standard on toilets down to 1.6 gallons. Those standards went into effect on March 1st of this year and they have worked tremendously well.

My similar kind of scientific polling to Senator Fowler's indicates that same kind of attitude, not only on the part of plumbers, but on the part of developers, on the part of people who are in the home building industry, on the part of people who are running plumbing supply businesses.

The response has been tremendously positive, even though, I might add, all of those groups were extremely reluctant initially to move to what they thought was a radical departure from the 3.5 gallons standard down to the 1.6 gallon standard.

The savings projected from that one conservation effort are absolutely remarkable. They will save by the year 2010 34 million gallons per day, and that represents a systemwide reduction of eight percent in the current demand. More importantly, that reduction, that conservation measure, will alleviate the need for a major diversion of the Connecticut River.

If you take aside the environmental damage, what that would do to our programs to restore salmon in the Connecticut River and other problems, and just simply look at a cost basis, we were estimating a cost of $600 million for diversion of the Connecticut River.

I think again we have the analogy to the energy crisis, that while existing sources of water may be relatively cheap because we made the capital investment 30, 40, 50 years ago, adding new capacity onto the system is enormously expensive. And these conservation efforts will delay and postpone the time at which we will have to add to our system, and the amount of new capacity we will have to add to our system.

In addition, in Massachusetts the average homeowner will save $70 per year in water and sewer costs by using those efficient toilets, and that eliminates all of the other costs and does not even take into consideration the enormous cost of water and sewer projects and waste water treatment projects that will be obviated by the reduction in water use.

So we have a situation where we have to ask ourselves, and the industry has asked, well, if these things work so well, if you have a

payback of three years or less on installing these new water efficient fixtures, why do we not just let the free market system work?

The answer to that is very clear. The answer is that the free market system cannot work perfectly in this instance because of the enormous federal subsidy to the cost of water. There is no other product, there is no other commodity, for which the federal government—and it is not just the federal government, but it is state governments and it is localities—provides a greater subsidy.

We have seen in our federal budget the billions and billions of dollars for waste water treatment facilities, and in the state governments, their billions of dollars in investment in waste water treatment and water supply, and in the local governments their billions of dollars of investment in water supply and sewer distribution systems.

The costs are absolutely enormous in terms of the public sector costs for subsidization. And as long as you do not reflect the true cost of water to the consumer, it will be easy for people, absent some kind of government encouragement, to just simply escalate those public sector costs, which is what is happening now with the rising demand for water.

This legislation will do two things: one is that it will encourage the industry to move to more water-efficient products; and it will also do significant things in terms of creating tremendous encouragement for a national standard. Right now, as Senator Fowler mentioned, we have a terrible problem in that each state and in many cases each locality is adopting a different standard.

As communities have come to grips with the lack of federal funding, a lack of state funding in many cases, for water supply and water treatment, they have changed their standards and their building codes. And having that patchwork of standards will create serious problems for the industry and for their manufacturing and for their own planning.

What we do with this legislation, by imposing in the case of toilets a 1.6 gallon standard, in the case of showerheads and other fixtures similar water conservation standards, is we give the industry the capacity to understand what is likely to happen and to begin to do the research and development to generate products that meet consumer standards and in fact improve on them.

I would like to particularly thank the manufacturers because they have already worked on this area. They have begun a process of adopting and they presently have under way standards for the 1.6 gallon toilets, national standards for consumer satisfaction.

I understand that in the next several months they expect to officially adopt those standards, which eliminates one of the major arguments against this legislation, which was that you couldn't manufacture a 1.6 gallon toilet and do it in a way that would meet consumer needs.

In 1907 in a message to Congress, President Theodore Roosevelt said that:

> To waste, to destroy our natural resources, will result in undermining in the days of our children the very prosperity which we ought by right to hand down to them.

That message I think rings even truer today, and I cannot imagine a prosperous America that lacks the water resources to quench the thirst of its cities and water its crops.

Mr. Chairman, by enacting the National Plumbing Products Efficiency Act we can take an important first step toward preserving our rivers and aquifers and ensuring that our children always have plenty of water to drink and to meet their needs and to have water available at an affordable cost.

Thank you very much.

[The statement follows:]

STATEMENT OF HON. CHET ATKINS, U.S. REPRESENTATIVE FROM MASSACHUSETTS

Thank you, Mr. Chairman. I greatly appreciate your invitation to testify before the Subcommittee on Consumer, and I applaud your decision to hold hearings on S. 583, the Plumbing Products Efficiency Act. I'd also like to express my thanks to Senator Wyche Fowler for all of his hard work and leadership on this important piece of legislation, and on the issue of water conservation.

When the oil shocks of the 1970s caused prices to skyrocket and mammoth gasoline lines to form, the Federal Government responded by making a concerted effort to cut demand for oil. The key component of its program was energy conservation, and the results were phenomenal. Over the past 15 years, small federal investments in energy efficiency and conservation have reduced energy consumption in this country by one third, and saved American consumers $160 billion per year.

I believe that we have the ability to achieve the same results for water, and that the need to save water today is as urgent as the need to save energy in the 1970s. I believe also that our prospects for success are equally promising, especially when one considers the amount of water we waste. According to the U.S. Geological Survey, between 1950 and 1985 the country's water use increased from 180 billion gallons per day to 400 billion gallons per day. France and the United Kingdom, meanwhile, maintain a daily residential per capita water usage that is less than half the U.S. average.

While water shortages in this country were once common only in the arid Southwest, they now extend from coast to coast. Both

the Metropolitan Boston area and New York State were forced to declare water emergencies last spring, and the Congressional Budget Office recently estimated that close to 150 of the nation's 756 large urban water supply systems will need additional supplies in the next decade.

Mr. Chairman, the National Plumbing Products Efficiency Act would not only allow us to combat those shortages, but it would also address a host of other pressing national concerns, such as our vast national infrastructure needs, the increased cost of living facing American consumers, and the seemingly insurmountable infrastructure costs facing states and localities.

I was first alerted to the promise of plumbing product efficiency by water officials in my home state of Massachusetts. Faced with the prospect of monumental water and sewer rate hikes from the $6.1 billion Boston Harbor clean-up project, and also faced with rapidly increasing demand for water that has spawned a number of heated debates over proposed new water supply projects, officals lowered from 3.5 to 1.6 gallons per flush the maximum water usage allowed for toilets in any new starts or renovations. That standard went into effect on March 1st of this year.

The savings projected from that one conservation effort are remarkable. By the year 2010, the installation of low volume toilets is expected to result in a demand reduction of approximately 34 million gallons per day, which represents a system-wide reduction of eight percent in current demand. Further savings will be rendered from eliminating or delaying the need to come up with new water supplies. A proposed diversion of

the Connecticut River, for example, which would cost up to $600 million and result in severe environmental damage, has been shelved until the full impact of water conservation alternatives has been weighed.

In addition, Massachusetts estimates that the average homeowner could save up to $70 per year in water and sewer costs by using efficient toilets. Such savings would be welcome all across the country, where water and sewer bills have been on the rise not only because of shortages, but also because of decreasing federal support for water and sewer projects and increasingly stringent federal water quality standards that demand costly upgrades or new treatment facilities.

The fact is that we currently have a wide range of low-flow toilets, showerheads, faucet aerators and other fixtures available to consumers that work just as well as conventional products, and it's ridiculous not to broaden their availability in the marketplace, as the National Plumbing Products Efficiency Act would do.

The average American uses over 18,000 gallons of water in his or her home each year. If every household replaced its plumbing fixtures with low-flow fixtures that met the standards set by S. 583, U.S. total daily water demand could be cut by 15 percent, or 6.8 billion gallons per day. We could also save billions of dollars in supply and treatment costs nationwide. In the Delaware River Basin alone, officials estimate that low-flow toilet requirements could save $250 million in costs that would be needed for new water supplies and wastewater treatment

facilities by the year 2020. States and municipalities across the country face an estimated $83.5 billion in necessary sewage treatment constructions costs, and billions more for water supply expansions and treatment system upgrades. While it is impossible to estimate what percentage of those costs would be eliminated with enactment of the Plumbing Products Efficiency Act, simple arithmetic using the figures supplied by states and towns that have mandated low-flow products shows that the dollar amount would be significant.

Opponents of this legislation have asked why we cannot allow the free market to dictate the use and availability of low-flow products. I believe that the primary reason is the fact that the true cost of water has never been reflected by its price. Until the price of water reflects the environmental degradation and capital expenditures it takes to come up with new supplies, water conservation will not be as attractive to manufacturers and consumers as it should be.

I would, however, like to congratulate the nation's plumbing and appliance manufacturers for striving to improve their products to reflect the growing need for water conservation. When Senator Fowler and I first introduced this legislation a year ago, we were told that our standards would threaten consumer well-being because efficient products don't work as well as conventional products. Since that time, however, a subcommittee of the American National Standards Institute has approved performance standards for the 1.6 gallon toilet, and the full body is expected to approve the standard by early next year,

meaning that the very experts who came into my office and told me that 1.6 gallon toilets do not perform up to their strict standards are now convinced that they can. Furthermore, every major toilet manaufacturer now sells a 1.6 gallon toilet, meaning that the same manufacturers who told me that low-flow technology is years away from perfection now are manufacturing and selling low-flow products.

In addition, a number of states and localities, including Rhode Island, Connecticut, Washington State, New York City, and the Delaware River Basin Commission, have joined states and localities such as Massachusetts, Glendale, Arizona and Los Angeles, California in enacting low-flow requirements. Feedback and studies there, and in Europe, where entire countries have made the switch to low-flow fixtures, indicate no problems with performance. In fact, a study performed in Phoenix found that the low-flow models actually worked better in terms of toilet clogging and multiple flushing than conventional toilets.

That is not to say that responsible officials and professional associations should not continue to study the performance of low-flow products and their impact on plumbing systems as a whole. I believe that the burden of proof, however, lies with opponents of this legislation, who so far have failed to show how products that are sold by dozens of manufacturers in hundreds of states and localities with no apparent ill effect pose any threat to consumer health or our national infrastructure.

It is simply foolish, in light of the vast infrastructure needs facing states and localities, and our enormous federal

deficit, to continue to flush our most precious natural resource down the drain and squander the billions of dollars it takes to supply and treat water. It also is foolish to continue to risk environmental degradation by damming and diverting waterways when we are not taking advantage of the most simple water conservation techniques available to us.

In a 1907 Message to Congress, President Theodore Roosevelt said that "to waste, to destroy our natural resources...will result in undermining in the days of our children the very prosperity which we ought by right to hand down to them." That message certainly holds true today, for I cannot imagine a prosperous America that lacks the water resources to quench the thirst of its cities or water its crops. By enacting the National Plumbing Products Efficiency Act, we can take an important first step toward preserving our rivers and aquifers, and ensuring that our children always have plenty of drops to drink.

Thank you.

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Senator BRYAN. Thank you very much, Congressman Atkins. We appreciate the testimony that both of you had to offer this morning, and we will excuse you now if you need to get about your other business this morning.

Senator FOWLER. Thank you, Mr. Chairman.

Mr. ATKINS. Thank you.

Senator BRYAN. Our first panel this morning will consist of: Mr. Edward R. Osann, Director of the Water Resources Program, National Wildlife Federation; Mr. Peter Berle, President of the National Audubon Society; Ms. Amy Vickers, Project Manager of Brown and Caldwell, Consulting Engineers; and Mr. Duane Cutler, Director of Water Conservation Marketing, Volt Energy Systems.

Welcome to the subcommittee hearing. We will begin our testimony on this panel from you, Mr. Osann.

## STATEMENT OF EDWARD R. OSANN, DIRECTOR, WATER RESOURCES PROGRAM, NATIONAL WILDLIFE FEDERATION

Mr. OSANN. Thank you, Mr. Chairman.

For the record, my name is Edward Osann. I am the Director of the Water Resources Program for the National Wildlife Federation.

I have a prepared statement, Mr. Chairman, and I assume that that will be entered into the record in full.

Senator BRYAN. We will incorporate that and make it a part of the record of these proceedings.

Mr. OSANN. With your permission, Mr. Chairman, I have written statements that I would like to enter into the record of the committee at this time in support of the bill: from the Environmental Defense Fund, the Texas Committee on Natural Resources, the Sierra Club Lone Star Chapter, the Sierra Club Houston Regional Group, the Sportsmen Conservationists of Texas, and John F. Long Homes Corporation from Phoenix, Arizona.

Senator BRYAN. Those statements of support will be included and made a part of our record.

Mr. OSANN. Thank you, Mr. Chairman.

The National Wildlife Federation is the nation's largest conservation organization. We have an ongoing interest in water conservation and the management of water resources. That interest is probably most clearly articulated in a resolution passed at our annual membership meeting in 1988.

Mr. Chairman, this is a water conservation bill. In a larger sense, it is also a water management bill. We appreciate your interest in holding these hearings, Mr. Chairman. Coming from what is perhaps the most arid state in the country, your interest is understandable.

But in fact, the benefits of this bill are actually nationwide, extending to water supply, water distribution, potable water treatment, waste water collection, and waste water treatment. Virtually every community in the country will find some degree of benefit from this bill.

New York City's Department of Environmental Protection estimated that after three years of the implementation of a 1.6 gallon per flush standard, water savings will reach nearly 40 million gallons a day in that jurisdiction alone. The Delaware River Basin

Commission estimates that the savings that is solely attributable, solely attributable to the difference in performance between the current 3.5 gallons per flush standard and DRBC's newly adopted 1.6 gallon per flush standard will reach 42 million gallons per day within the Delaware River Basin by the year 2020. And they associate that with savings in capital costs for water supply and waste water treatment of $250 million in that basin alone.

The California legislature has recently passed and the Governor has recently signed a bill establishing 1.6 gallons per flush as the standard in all new construction in California statewide in 1992, and the Department of Water Resources has estimated that by the year 2010 that single piece of legislation, applicable only to new construction, will save 115,000 acre-feet of water in California statewide, which converts to nearly 103 million gallons per day.

So enactment of S. 583 will keep money in the pockets of taxpayers and ratepayers nationwide and protect the environment.

We feel that enactment of this legislation is needed now, Mr. Chairman. And by way of example, I point out that there are some eight to twelve million water closets installed each year in this country. They have a life expectancy that can range up to 50 years. With installation costs serving as a substantial barrier to early replacement of these fixtures, we feel that it is important for water saving standards to be promulgated as soon as possible.

I think it is also important to point out that, unlike other standard-setting exercises that the Congress has gone through, this bill is not intended, not designed, to set standards for products that are not available, not invented yet, the point being that products are now commercially available that meet the standards contained in the bill.

As recently as the end of September of this year, 28 manufacturers of showerheads, 12 manufacturers of kitchen sink faucets, and 8 manufacturers of lavatory faucets had certified to the California Energy Commission that their products perform within the standards that are contained in this bill.

We believe that federal efficiency standards for water use are particularly appropriate. The committee will hear testimony to the effect that the current voluntary consensus standard-setting process through the auspices of the American National Standards Institute is sufficient and that it ought to be the sole basis for setting performance standards, and continue that way in the future.

The heart of this bill, Mr. Chairman, is, in effect, that we are setting a new standard for standard-setting in this bill. The current ANSI process has accomplished a lot and will continue to accomplish a lot in the future. But we need to recognize that by nature, by definition, it is a voluntary, consensus-based process.

In reaching a consensus among voluntary participants, compromises are made inevitably. Now, some of those compromises may reflect important public policy issues. Some of them may also simply reflect the administrative or commercial convenience of as few as one single manufacturer. The point being that the ANSI standard process does not assure, it is not designed to assure, that the standards produce the most water efficient products that can be produced.

The standard in this bill, in S. 583, is that the standards are to achieve the maximum efficiency of water use that is technologically feasible and economically justified. The effect of this standard over time will be to assure that U.S.-made products remain at the forefront of technological change.

Mr. Chairman, we have recommended a number of areas that the bill can be strengthened and improved. I will not go over those in detail at this point, but simply call the attention of the committee to that portion of my testimony.

In conclusion, I would just like to observe, Mr. Chairman, that perhaps never before have the demands and the expectations of the American people for protection of the environment been greater. There is a grassroots interest in environmental protection around the country, interest in recycling, interest in toxic reduction, in clean air.

The American people want an opportunity, want the wherewithal to reduce their impact on the environment, and this bill provides them with a few simple tools that can make a substantial improvement in the way water is used in this country.

Thank you, Mr. Chairman.

[The statement follows:]

STATEMENT OF EDWARD R. OSANN, DIRECTOR, WATER RESOURCES PROGRAM, NATIONAL WILDLIFE FEDERATION

Thank you, Mr. Chairman for the opportunity to present the views of the National Wildlife Federation on S. 583, the National Plumbing Products Efficiency Act. My name is Edward Osann, and I am the Director of the Federation's Water Resources Program. With affiliates in 52 states and territories and over 5.8 million members and supporters, the Federation is the nation's largest conservation organization. We have an ongoing interest in water conservation and the management of water resources. That interest is expressed in the resolution adopted by the National Wildlife Federation in 1988 regarding Water Resource Management. (See Attachment.)

**The National Wildlife Federation strongly supports the purposes of S. 583.** The bill would increase the availability of water-efficient plumbing products throughout the United States, and provide consumers with useful information regarding the water use and operating costs of such products. By establishing reasonable water conservation standards for newly manufactured plumbing products, the bill will bring about significant and predictable improvements in water use efficiency nationwide. The bill will conserve both natural and fiscal resources.

NWF has two interrelated goals in supporting S. 583 -- goals we believe are shared by the sponsors of the bill. We seek to speed the commercialization and market penetration of water efficient plumbing

products. And we also seek to provide predictable water savings for cities, towns, and rural communities to plan capital investment for water supply, potable water treatment, and wastewater treatment. As a result, unnecessary dams and other disruptive water supply projects will not be built, the use of water of marginal quality can be reduced, and limited dollars for wastewater treatment can be used more efficiently. We are open to different ways of accomplishing these goals, but we have found S. 583 and its companion legislation in the House, H.R. 1185, to be the most reliable and cost-effective approach to these twin objectives presented to date.

We commend Senator Fowler and Representative Atkins for their leadership and their commitment to this water saving legislation.

**Enactment of S. 583 will address several important national goals.** These include:

• *Water savings* The provisions of the bill will reduce indoor water use in new residential construction by about 25%. Additional savings will result from new commercial and institutional construction, and from renovation and replacement of existing plumbing products. The annual water savings in new residential construction alone will equal the amount of water used by a city of 100,000. Since such savings are permanent, the effects of the bill will be cumulative, i.e., annual water savings the second year that the bill is in full effect will equal the water use of a city of 200,000.

• *Wastewater treatment* The Environmental Protection Agency has reported that the states will need $83.5 billion over the next 20 years to build the publicly owned treatment plants needed to comply with the Clean Water Act. Of this amount, $15.6 billion will be needed to accommodate new growth during this period. If the 25% reduction in indoor water use in new construction yields but a 10% savings in wastewater treatment capital costs associated with this growth, the bill will save over $1.5 billion in capital outlays for wastewater treatment.

• *Energy savings* The bill contains a nationwide showerhead efficiency standard somewhat more stringent than that currently in effect in some states. The extension of the energy saving benefits to the nation as a whole will produce electricity savings of about 2400 average megawatts -- the transmitted output of some eight 500-megawatt coal plants -- and will reduce oil and gas use by the equivalent of 40,000 barrels of oil per day. These savings are worth

over $10 billion to consumers. They also contribute to the nation's energy security and to the goal of reducing greenhouse gas emission.

• *Reduced Federal outlays for the use of water and energy* The installation of water conserving plumbing products meeting the performance standards contained in the bill in new and renovated Federal buildings will result in significant reductions in water and energy use. The potential financial savings on water bills is at least $2 million per year (based upon a conservative price of $1 per thousand gallons of water), more than offsetting the cost of the regulatory program authorized by the bill. Additional savings will result from sewage treatment and energy bills.

• *Housing Costs* Provisions of the bill will lead to reduced housing ownership costs, resulting from reduced water and energy operating costs, and eventually from reduced pipe size requirements in new construction. The likelihood of construction moratoria due to limited water and sewer capacity will also be reduced.

• *Benefits geographically widespread* The benefits of the bill, encompassing water supply, water distribution, potable water treatment, wastewater collection, and wastewater treatment, extend to virtually every community in this country. Some examples:

-- New York City's Department of Environmental Protection estimates that 3 years after the effective date of its 1.6 gpf standard, water savings will reach 39.1 million gallons per day (mgd);

-- The Delaware River Basin Commission estimates that the savings that is solely attributable to the difference between the current 3.5 gpf standard and its newly adopted 1.6 gpf standard will reach 42 mgd by the year 2020, with an associated reduction or deferral of about $250 million in capital costs for water supply and wastewater treatment;

-- Savings from the Massachusetts 1.6 gpf code requirement are expected to reach 45 mgd statewide; and,

-- California's Department of Water Resources estimates that its new state law requiring 1.6 gpf in new construction will save 115,000 acre-feet of water by the year 2010, or nearly 103 mgd.

S. 583 will keep money in the pockets of taxpayers and ratepayers from coast to coast, while it greatly reduces our waste of water and energy.

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**Federal legislation is needed now.** Several factors make the enactment of S. 583 especially timely:

• New water users will be increasingly costly to serve in coming years. Most communities are at the end of the era of cheap water. Higher water and sewer costs will result from --

-- the end of major Federal subsidies for new water supply projects;

-- new requirements for potable water treatment under the Safe Drinking Water Act Amendments;

-- the phase out of Federal grants for new wastewater treatment facilities; and,

-- higher costs for state and municipal financing resulting from new limitations on tax-exempt bonds.

The net effect of these trends is to increase the cost of new water and wastewater service substantially, and to increase the cost-effectiveness of water conservation for consumers and water system managers alike.

• 8 to 12 million water closets are installed each year, each with a life expectancy of up to 50 years. With installation costs serving as a barrier to early replacement, it is important for water saving standards to be promulgated as soon as practicable.

• Some 4.4 million kitchens and 5.5 million bathrooms were remodeled in 1988. Concern over the contribution of brass faucets to lead levels in tap water may soon lead to even greater rates of faucet replacement.

• Over 6 million clothes washers are sold each year, with a life expectancy of 13 years. Nearly 4 million dishwashers are sold each year, with an average life expectancy of 10 years. These products will constitute an increasingly large share of indoor residential water use as bathroom plumbing products become more efficient.

• Products are now commercially available that meet the standards contained in the bill. The enumerated standards are both realistic and obtainable. They represent the upper end of performance of products that are profitably manufactured and sold today in the United States. As of September 28 of this year, 28 manufacturers of showerheads, 12 manufacturers of kitchen sink faucets, and eight manufacturers of lavatory faucets certified to the California Energy Commission that their products performed within the standards

contained in S. 583. Moreover, one major company notable for its opposition to this legislation testified before the Delaware River Basin Commission in favor of the fourth quarter of 1991 as a final effective date for a 1.6 gpf standard for water closets -- a date earlier than that contained in the Fowler Bill. The company stated that such a date would allow for an orderly transition and give manufacturers sufficient time for product development and manufacturing.

**Federal efficiency standards for the water usage of newly manufactured plumbing products are necessary and appropriate.** Some have argued that the Federal government has no proper role to play in the establishment of efficiency standards for plumbing products. We strongly disagree.

The current voluntary standard-setting process does not assure that plumbing products are as water efficient as they can reasonably be. The water use of such products has significant long-term impacts on public expenditures and environmental quality. Such factors are not fully reflected in the current ANSI standards or in the marketplace. Thus Federal standards, designed to achieve the "maximum efficiency of water use" that is "technologically feasible and economically justified," are needed to supplant the water use standards developed by consensus within the plumbing industry through ANSI. It should be noted, for instance, that some plumbing manufacturers are now contemplating increasing the current ANSI standard for the flowrate of kitchen faucets.

Federal law can also fill large gaps in the current state and local regulatory framework that impede the realization of conservation savings. Most existing non-Federal water use standards are contained in state or local plumbing codes. However, not all jurisdictions have plumbing codes, and not all plumbing installations require plumbing or building permits, which is generally what triggers the code requirements. Even where applicable, code enforcement is notoriously spotty, and is often directed at systems and conditions considered to have higher priority than plumbing product flowrates.

Only a handful of states have set efficiency standards covering the sale as well as the installation of plumbing products, which is necessary to cover products sold at retail to consumers. Retail sales comprise a significant and growing share of the total market for plumbing products. However, enforcement of such statutes at the retail level is virtually nonexistent, and non-conforming products

abound. States are poorly equipped to police the retail sales of plumbing products.

Yet with the proliferation of state and local action within the last two years, there is a distinctly Federal interest in the restoration and maintenance of an orderly national market for plumbing products. Not only are there no fewer than 3 different standards for showerheads and 4 different standards for water closets, but state testing, certification, and labeling requirements can and do vary. This trend is certain to continue as more states and communities recognize the value of water-efficient products and take independent action to require their installation.

Federal efficiency standards will also make better use of the massive Federal investment in water supply and wastewater treatment infrastructure. Over $40 billion has been invested in wastewater treatment plants alone, while water supply projects have received additional billions in Federal funding. The continued use of inefficient plumbing products would have the effect of squandering this Federal assistance at a time when it is unlikely to be available in the future.

The Federal role in setting efficiency standards for the energy usage of consumer appliances has already been articulated by Congress in the National Appliance Energy Conservation Act. However, it should be noted that this energy program will not necessarily save much of the water now used by clothes washers and dishwashers. Title II of S. 583 is needed to ensure that justifiable water savings are achieved in the future performance of these major water-using appliances.

**The workings of the bill are patterned after the widely supported National Appliance Energy Conservation Act of 1987.** Although some have asserted that the bill would establish a "Federal Plumbing Czar," this imaginary autocrat is nowhere to be found in the bill. As with the Appliance Energy Program already enacted into law, S. 583 authorizes four sets of rules:

- Test procedures to measure the water efficiency of covered products must be established by the Secretary of Commerce, acting through the National Institute of Standards and Technology. These test procedures may be finalized only after public notice and comment,

as is the case with most Federal rulemaking. Test procedures may be updated in the future by the same process.

• Performance standards for covered products are also to be established by the Secretary of Commerce, again following public notice and comment. As with the Appliance Energy legislation, S. 583 contains an initial group of performance standards in the bill, to provide a greater degree of certainty about the workings of a new regulatory program. All performance standards are to be reviewed every five years to take into account new technology and other relevant factors.

• Based upon the performance standards established by Commerce, the Federal Trade Commission is charged with setting regulations for labelling and printed advertising of covered products. The same kind of information that now advises consumers of the operating costs and energy use of major appliances would also be provided for plumbing products, following an opportunity for public notice and comment.

• The Secretary of the Treasury is also directed to prescribe rules under which the Customs Service will bar non-conforming products from entry into the United States.

There are at least three virtues in this regulatory scheme that are worth highlighting. First, the labeling requirements of the bill will make the law substantially easier to enforce than current state and local codes. More information will be provided on each covered product, and there are specific penalties for mislabeling covered products.

Secondly, the Customs Service will be called upon to reject non-conforming imports, a task that should offer a new measure of protection for all other manufacturers, domestic or foreign, that adhere to the standards.

Finally, the bill leaves the responsibility for all other aspects of plumbing design, manufacture, and installation -- durability, public health, pipe sizing requirements, etc. -- to those non-Federal bodies, such as ANSI, model code organizations, and professional societies that have important roles to fulfill.

**S. 583 can and should be improved before enactment.** We believe that the bill can benefit from clarification and strengthening various provisions, and by accommodating the legitimate concerns that have been expressed about this new program by responsible elements of the plumbing industry. Potential amendments for consideration by the committee might include:

-- an appropriate role for ANSI test procedures in the Federal regulatory scheme;

-- additional effective dates for water closets other than 2-piece tank-type and floor-mounted flushometer valve toilets, (which are currently available and together comprise some 80% of total sales);

-- Clarification of those products not subject to regulation (Sec. 103(f));

-- Clarification that effective dates are based upon the date of manufacture, rather than the date of sale (Sec. 103(b));

-- Authority for design standards, as well as performance standards;

-- Specific design standards for showerheads, relating to restrictor removal and soap up valves;

-- Consideration of additional covered products, including pressure reducing valves, ballcocks and flapper valves packaged and shipped as replacement parts, toilet dams, and lawn sprinklers and sprinkler heads;

-- Criteria for the Secretary's reevaluation of test procedures and standards in future years;

-- The relationship of Title II requirements with the Department of Energy's current rulemaking for 1993 energy standards.

In conclusion, Mr. Chairman, the demands and expectations of the American people for the protection of the environment have never been greater. This water conservation bill provides a few simple tools -- clear labels, useful product information, and modest technical advances -- for all Americans to reduce their impact on the natural environment, without compromising their standard of living. S 583 will save water and it will save money. I urge the committee to give this bill favorable consideration, and I appreciate your willingness to undertake this hearing.

Thank you for the opportunity to present these views.

Working for the Nature of Tomorrow

NATIONAL WILDLIFE FEDERATION

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October 25, 1989

The Honorable Richard Bryan
Chairman
Consumer Subcommittee
Committee on Commerce, Science, & Transportation
United States Senate
Washington, DC 20510

Dear Mr. Chairman:

This letter is intended to supplement my testimony on behalf of the National Wildlife Federation at the hearing of the Consumer Subcommittee on October 4, 1989, regarding S. 583, the National Plumbing Products Efficiency Act. I respectfully request that this letter and its attachments be made a part of this hearing record.

**Percentage of US Population Covered by State and Local Water Conservation Standards**

In response to a question during the hearing, I estimated that state and local jurisdictions containing 40% of the population of the United States had established a standard of 1.6 gallons per flush for water closets. After an opportunity to check such figures more carefully, I would now estimate this figure to be about 34%. This is based upon action by six states (Massachusetts, Connecticut, Rhode Island, New York, Washington, and California), the Delaware River Basin Commission (which commits 3 additional states to action), and local jurisdictions in Arizona and Texas.

Wastewater Treatment Cost Savings

My testimony of October 4 pointed out that if a 25% reduction in indoor water use in new construction (the anticipated effect of S. 583) would yield a 10% savings in wastewater treatment capital costs associated with this growth, the bill would save at least $1.5

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billion in capital outlays for wastewater treatment. The subcommittee may wish to review a study prepared for EPA by the California Department of Water Resources dated August, 1980 entitled "Effects of Water Conservation Induced Wastewater Flow Reduction: A Perspective." The study concluded that water conservation measures applied to new growth served by new wastewater treatment facilities would yield capital cost savings averaging 7% for wastewater collection systems and savings if up to 8% for wastewater treatment plants.

However, the study also found that where new growth would be served by additions to or expansions of existing wastewater facilities, the capital cost savings attributable to conservation were much larger: 15% for collection systems and 22% for treatment plants. This suggests that a significantly larger fraction of the $15.6 billion expected to be needed to accommodate new growth over the next 20 years may be saved as a result of enactment of S. 583.

## Benefits for Those Served by Septic Systems

The record of the hearing would not be complete without some mention of the benefits of efficient plumbing products and water using appliances for communities served by septic systems. About 22 million households nationwide use septic systems for wastewater treatment. It is generally known that 15 to 25 percent of these systems have problems with surface ponding or back-up at some time during the year. About 1.5 million systems are renovated each year. Costs range from $2,000 to $4,000 for rebuilding, and pumpouts can cost $100 or more.

Flow reduction is the most cost-effective way to rehabilitate septic systems. In addition to the straightforward benefit of reduced hydraulic loading, water conserving fixtures have the effect of concentrating waste and increasing the operating temperature (by reducing cold water inflow), which both serve to improve the level of treatment provided by the system. In areas of hard water, reduced flows will also have the effect of reducing the rate of mineral buildup in the soil, thus extending the life of the system.

**Response to Testimony of the Plumbing Manufacturers Institute**

1. The legislation is unnecessary and will save no additional water. The current process of setting standards by consensus among manufacturers, designers, installers, and users, coupled with state and local regulation, will continue to bring about water conservation.

RESPONSE: The notion that the regulatory program in the bill merely duplicates the current non-Federal procedures centered around voluntary standards is flawed for three important reasons. First, the standards authorized by the bill and the voluntary standards promulgated by the American National Standards Institute are intended to accomplish different purposes. The purpose of the standards authorized by S. 583 is "to achieve the maximum efficiency of water use which the Secretary determines is technologically feasible and economically justified". S. 583 is a specific statutory statement that water conservation is to be a high priority for the design of plumbing products. This is not the purpose of ANSI standards. For example, the 1989 revision to ANSI A112.18.1M, the voluntary standard applicable to showerheads and faucets, states:

> The purpose of this American National Standard is to establish a nationally recognized standard for plumbing fixture fittings for the guidance of manufacturers, distributors, and purchasers, to promote better understanding between suppliers and users, and to serve as a basis for fair competition in furnishing plumbing fixture fittings which meet the minimum life, functional, and appearance demands of the trade.

Thus it is clear that the voluntary standard-setting process is designed to set minimum criteria for a variety of product characteristics, not to maximize water savings within a realistic economic and technical framework, as proposed by S. 583. Indeed, because of antitrust considerations applicable to industry standard setting, ANSI participants may actually be precluded from setting standards that maximize water efficiency, when such standards might be based on technology that is not widely available throughout the industry. (See testimony of Pat Higgins, p. 5.)

The second aspect of this flawed comparison offered by PMI and others is the regulatory context in which the standards are used. The ANSI standards, in and of themselves, do not bar products from being sold or installed. Indeed, for water closets, the applicable ANSI standard merely defines categories of products (i.e., "conventional",

"water saver", and "low consumption"). The sale or installation of any of these types of water closets is not precluded by the ANSI standard. The standards authorized by S. 583, in contrast, are minimum performance standards that are fully enforceable under the law.

Finally, the third flaw underlying the charges of duplication and redundancy leveled against the bill relates to the expected extent of regulatory coverage. S. 583 would clearly be national in scope. The voluntary standards, on the other hand, must be given the force of law by states and localities. Uniformity is supposed to be achieved by the action of the four principal model code organizations, whose codes are subsequently adopted by the majority of states and communities that have building codes. However, the first model code organization to consider low consumption standards comparable to those contained in S. 583 has decided to pass the buck. The 1990 edition of the National Standard Plumbing Code, published and administered by the National Association of Plumbing, Heating, and Cooling Contractors, has removed previous water use limits for water closets, showerheads, and lavatory and kitchen faucets, and left states and localities on their own to fill in the blanks. Clearly, the current system will not achieve the level of water savings offered by S. 583 for a long time to come.

2. PMI surveys on faucet and showerhead production show that virtually 100% of these products are water conservation models. A 1982 survey of fixture manufacturers found that 98% of water closet production at that time consisted of water conservation models.

RESPONSE: PMI surveys of its members do not directly equate to the product actually on the market. Not all plumbing manufacturers are members of PMI, and a noticeable amount of product is available at retail that does not conform to the standard. A substantial amount of this nonconforming product appears to be imported, which makes it all the more difficult for the states to regulate.

Similarly, PMI's findings about the implementation of the existing 3.5 gpf standard in 1982 are less than comforting. Just last year, PMI member Bruce Martin of Water Control International reported these test results:

> While most combinations marketed as "Watersavers" satisfactorily meet the extraction and drainline carry requirements, many consume more water per flush than is allowed by the current standard. These units really perform in the lower end of the "Conventional" group.

-- from a presentation at the 1988 ASSE Refresher Course, reprinted in Plumbing Standards, Vol.2 No.4, October, 1989.

The subcommittee may wish to explore how such findings of noncompliance with the voluntary standards have been handled regarding public notice, product recalls, fines levied, production changes, etc.

3. Proponents of the legislation vastly overestimate the amount of water savings that might result by changing the current 3.0 gpm standard to 2.5 gpm.

RESPONSE: The amount of water savings has not been overestimated, because we recognize the importance of the reduction of the maximum flowrate to be the improvement of the relative performance between showerheads. For variable orifice showerheads, the difference in flowrate should be nearly 0.5 gpm across a full range of pressure conditions. For fixed orifice showerheads, the differences in relative performance at lower pressures may be somewhat less.

An even larger savings of both water and energy will result from simply establishing an enforceable and effective national performance standard (be it 2.5 gpm or 3.0 gpm) to supplement the voluntary standard/patchwork code arrangements that currently allow for the sales and installation of significant amounts of nonconforming product, as discussed above.

4. Lowering showerhead flow rates further will be counterproductive because lower rates will be unacceptable to a majority of consumers, who will determine how to override the flow control system and end up using significantly more water than is now used.

RESPONSE: PMI offers no evidence that showerheads with lower flowrates will be unacceptable to a majority of consumers, or even to a significant minority of consumers. As of September of this year, 28 manufacturers have certified to the California Energy Commission their production of showerheads with maximum flowrates of 2.5 gpm or less. Nearly 1.1 million showerheads performing within this criteria have been distributed to customers in Los Angeles alone during the past year, as part of that city's water conservation program.

This assertion by PMI is especially puzzling in light of the statement in PMI's own testimony that the average of 15 different showerhead models tested earlier this year by PMI was 2.48 gpm at

80 psi. This suggests that products that conform to the showerhead standard proposed by S. 583 are widely available and acceptable to a broad segment of consumers.

**Response to Testimony of the "Ad Hoc Committee on Water Conservation"**

1. The recent report by the Congressional Research Service concurs that further research is necessary before proceeding with federal legislation.

RESPONSE: The CRS report makes a number of observations regarding the value of further research, observations with which we would concur. However, we are unable to locate any passage in this report that asserts that more research is necessary before Congress enacts the legislation now under consideration by the subcommittee.

2. ULF technology may cause problems under certain conditions, as, for example, the case with Mount Ida College in Newton Center, MA.

The Massachusetts Board of State Examiners of Plumbers and Gas Fitters conducted a review of the Mount Ida College dormitory experience and found that the 1.6 gpf products at issue were not at fault. Indeed, the Board has subsequently extended the certification of the manufacturer to sell such products in Massachusetts. Factors that may have contributed to the need to remove the products from the dormitory were abuse by students and excessive student population per fixture.

3. When filling a bathtub, a ULF fixture is a mere aggravation which won't save any water at all.

RESPONSE: S. 583 does not propose a standard for bathtub faucets for precisely this reason.

**Response to Testimony of Whirlpool Corporation and the Association of Home Appliance Manufacturers**

1. Total water usage of clothes washers and dishwashers is small.

RESPONSE: On the contrary, the water used by these appliances represents a significant fraction of indoor residential water use. See the attached charts prepared by the Delaware River Basin Commission.

2. With proper use and loading, an automatic dishwasher uses less water than washing dishes by hand.

RESPONSE: This is an interesting fact, but not directly relevant to S. 583. The bill neither seeks nor serves to discourage consumers from using dishwashers

3. Too little water could lead to poor washing results.

RESPONSE: The results portrayed by AHAM and Whirlpool are the effects of denying water to machines that have not been engineered for reduced water consumption. This is not the action that is authorized in Title II of S. 583.

4. Further reduction in energy and water use could have serious negative effects on the performance level of these products.

RESPONSE: This assertion simply illustrates the complacency of certain appliance manufacturers regarding water conservation, and underscores the need for enactment of Title II of S. 583. The subcommittee should consider such testimony in light of the performance of these same appliance manufacturers overseas. For instance, Whirlpool International, of which Whirlpool Corporation owns a controlling interest, manufactures at least two brands of high efficiency clothes washers in Western Europe. For example:

> Recent introductions in Europe clearly are responsive to consumers' environmental concerns. . . .
>
> A new line of Philips brand front loading washers, produced by Whirlpool International, feature Dynamic Consumption Control (DCC). By automatically adjusting the quantity of water and energy consumption according to the weight and type of laundry, the machines save detergent, water, and energy. The top models feature energy consumption of 2.0 kWh, 75 liter water consumption, as well as variable spin speeds from 120 to 1,200 r/min and noise levels of just 58 dB(A).
>
> Bauknecht washers, also produced by Whirlpool International, feature a Direct Injection System (DIS), in which the water and detergents are fed directly into the heart of the drum, to enhance washing performance. Water consumption is just 75 liters and energy consumption is 1.9 kWh, and top models have spin speeds of up to 1,400 r/min.
>
> -- "Meeting World Laundry Needs," by David E. Simpson/Senior Editor, Appliance, Vol. 46, No. 9, September, 1989, pp. 75-81.

The maximum water use per cycle of these two groups of products is actually 90 liters, which, at less than 24 gallons, still greatly outperforms the machines that dominate the U.S. market today.

Similarly, dishwashers of European design and manufacture are demonstrating improved water saving technology. The Asea brand of dishwashers manufactured in Sweden and available in the U.S. since June, 1988 provides cleaning capacity for larger than standard loads while using less water -- 7.5 gallons, compared with the range of 9.16 to 12.33 gallons for U.S. dishwashers as reported by AHAM. Within 30 days, Asea expects to introduce a new series of dishwashers with the same large capacity (14 place settings) that will use a maximum of only 6.3 gallons.

5. Labeling provisions of the bill are unnecessary, excessively burdensome, and not likely to assist consumers in purchasing decisions.

RESPONSE: This testimony appears to be misdirected to the labeling provisions of Title I. Title II of S. 583 imposes no new labeling requirements upon appliance manufacturers.

6. Opportunities for reducing costs to the consumer are slight.

RESPONSE: The small estimates of consumer savings provided in this testimony understate the value of the legislation because: the average water costs used in the calculations mask sharply varying regional differences in costs; wastewater treatment costs, either for sewer service or septic maintenance were excluded; and energy cost savings were excluded.

**Response to Testimony of Patrick Higgins**

1. Plumbing products are married to a properly sized drainage and vent system. We are now discharging low consumption products into a system designed to accommodate discharges with up to 65% more water. The possibility exists for more frequent stoppages.

RESPONSE: There is more diversity in the sizing of the drainage system than this statement would lead the reader to believe. Since the time Dr. Hunter concluded his work in the early 1940's, drain pipe sizes in new construction and renovation have been shrinking as fixtures have been improving. Since the late 1960's, codes for one- and two-family homes have departed from the Hunter formulas substantially. Furthermore, the drainlines in the building stock erected prior to 1940 cannot be assumed to have been sized to the Hunter formulas.

In most applications, other sources of "grey water," such as sinks, showers, and washers are available to contribute to the

transport of solids in the drainline. The possibility for drainline stoppages should be more accurately be placed in perspective. It primarily relates to long drainlines to individual water closets, lines that may even be prone to clogging with 3.5 gpf fixtures. Federal water conservation standards should not be viewed as unreasonable simply for failing to provide complete insurance against poor plumbing system design. Under the bill, local codes may still specify conditions where blowout fixtures or macerator toilets are required -- without resorting to 3.5 or 5 gpf units.

2. OMB Circular A119 requires the Federal use of voluntary consensus standards before the promulgation of governmental standards.

RESPONSE: Circular A119 recognizes that there may be shortcomings in voluntary consensus standards. It also qualifies the preference for voluntary standards to those applications that are consistent with law. S. 583 proposes to write new law specifically to achieve a level of water efficiency that will not be met through voluntary standards.

3. ANSI has expanded the requirements for labeling of both box and product as to flow rate and compliance with the standards.

RESPONSE: New ANSI labeling requirements for water closets have yet to be published. The latest ANSI labeling requirements for fittings such as showerheads are severely deficient. Flowrates are not required to be permanently affixed to the product. Once installed, no lay person will know the design flowrate of the product.

4. Two years is a good benchmark for delivery of a china product in order to perform the appropriate research and development.

RESPONSE: The effective dates of the bill provide for such a two year period to allow for the orderly adaptation to the new standards by water closet manufacturers.

5. Potential for scalding in the shower increases with each progressive restriction of flow in the showerhead.

RESPONSE: Tap water scalding is a problem that should be getting more attention from the plumbing industry than it currently is. Within the past month, the National Plumbing, Heating, and Cooling Contractors Association has declined to require thermostatic protection in shower valves in new residential construction in the National Standard Plumbing Code. Fortunately, states are beginning to move on their own in this area, as well as in water conservation.

The potential for scalding from showerheads of all flowrates should be studied by the plumbing industry, and by the Consumer Product Safety Commission if necessary. Products are commercially available to provide in-line scald protection either on the showerhead arm or built into the showerhead itself. It is worth noting that ANSI has not proscribed a minimum flowrate for showerheads, and many are on the market that perform at rates substantially below the maximum flowrate contained in S. 583.

6. Products that use more water than allowed under the bill should continue to be available for installation on existing drainage systems.

RESPONSE: This assertion suggests that there will be a significant number of circumstances where installation of 3.5 or 5 gpf water closets will still be necessary for proper drainline function. As noted above, it ignores the technology that is available today, and will continue to be available in the future, for this undoubtedly small set of conditions. These products include macerator toilets which liquify solid materials, and blowout fixtures, designed to prevent obstructions. The continued manufacture of "water saver" products (3.5 gpf) for use in various applications would undermine the basic concept of Federal product performance standards, and would also blur the division of Federal and state/local responsibilities upon which the bill is based. It would put the Federal government into the business of writing a Federal plumbing code, specifying which products may be installed where, which neither the supporters nor the opponents of the bill are advocating.

Respectfully submitted,

E. R. Osann

Edward R. Osann, Director
NWF Water Resources Program

Senator BRYAN. Mr. Ossan, thank you very much for your testimony.

Mr. Berle, we will hear from you next.

## STATEMENT OF PETER A.A. BERLE, PRESIDENT, NATIONAL AUDUBON SOCIETY

Mr. BERLE. Good morning, Mr. Chairman. My name is Peter Berle. I serve as President of the National Audubon Society. We have submitted written testimony. I move its admission in the record and will summarize it in the interest of time.

Senator BRYAN. It will be included in the record.

Mr. BERLE. The Audubon Society consists of 570,000 members around the United States, organized in chapters in all of the 50 states. We also have a substantial scientific and research effort. We manage sanctuaries, we publish, we are involved in television.

We are engaged in a whole host of environmental issues that affect both the country and the globe, and I have had an opportunity on numbers of occasions to extol the natural wonders of Mono Lake and the need to preserve the Platte River as an important stopping place for migratory birds.

So you can imagine that when I said to a public dinner last night that I was on my way to Washington from New York to talk about plumbing fixtures, showerheads and toilets, there was a certain amount of snickering around the crowd.—

But I think this is a hearing which is perhaps more significant than a lot of the specific issues that we are involved in. Representative Atkins was right when he said that we are at a point in time that is comparable to where we were with energy shortly after World War II.

You will recall in that period of time we were buying diesel or heating oil at six cents a gallon and we were building buildings which assumed that there was a limitless supply of that commodity at that price. And it took the shocks of the sixties and seventies to shake us out of that profligacy.

We are in the same situation with respect to water, and indeed water is perhaps a more significant key to all of our human environmental as well as natural environmental problems than energy ever was.

I would also like to follow up on an issue of cost which was raised, and that comes not only from the comments of Mr. Atkins with respect to the costs of new capital projects to supply water, which are much more expensive today than they were before and costs increasingly prohibitive, but one of the issues that we are now living with is the substantial costs of operation and maintenance of this vast system of water treatment which we have built throughout this country.

In a previous incarnation I was Commissioner of Environmental Conservation for the State of New York. That was during the period from 1976 to 1979, when we were building one billion dollars worth of sewage treatment plant construction per year.

That was the largest publicly financed construction program in the United States at the time, simply within the single State of New York. The thing that people were not focused on at that point was the tremendous operation and maintenance costs which keeping these plants going were imposing and continue to impose on the municipalities that have them.

Water conservation is going to be important not only to preserve a valuable resource, but also to put some control on the tremendous costs that are being incurred by localities all over the country as they treat flows going through these plants. While the argument has been made that the marketplace will take care of this issue, the marketplace does not reflect the high costs that municipalities are going to continue to incur. We can help those municipalities by restricting and limiting flows that are going through those plants, because basically when you have to treat less fluid it costs less to do so.

The other thing that is important to point out with respect to the marketplace arguments that are being made is that, as was the case with respect to electrical appliances, the marketplace does not

work as it relates to the problem in the rental market, because the builder does not pay the cost of the water that is used and the treatment of that water. It is frequently his desire to minimize construction costs because those are then passed on to the purchaser or the renter, who then is caught with having to pay the higher maintenance costs.

So marketplace arguments simply are not persuasive in this particular case.

Another important point is that as we lessen demand or if we are able to reduce demand, not only do we have substantial savings as it relates to future projects, but we also have some predictability in the system.

The National Audubon Society has been involved in a major scrap with respect to the Two Forks Dam in Colorado near Denver, and one of the issues there is how good can conservation projections be and therefore how well can we predict future need and how well can we predict the real need for additional projects.

I submit that an appliance efficiency standards bill such as this one, a plumbing standards bill, will give us some standards as we look forward, so we can predict much more accurately future needs; and that will hopefully lessen the argument for expensive projects which are not only extremely expensive, but are environmentally not satisfactory.

I think you are well aware, Mr. Chairman, that a number of states have already taken action to impose standards. New York is one. California is another. Balkanizing the system by which we supply products for the American market is not a particularly productive way to go, and therefore national standards are not only important but extremely desirable.

The environmental impacts are clear, especially in places that now take water of lesser quality and treat it in order to put it in shape to drink—as is true in New York, where we take water out of the Hudson; and in communities in Virginia where they take water out of the Potomac. To the extent to which we can lessen our requirement to take those less potable supplies, it is desirable.

Not only does it cut costs, but it also ensures better quality of water for the consumer.

It is clear that in some states we are seeing action not only at the state level, but at the local level. In Arizona, for example, some communities have adopted standards. Again, a national standard we think is extremely desirable, not only for the standardization, but also in recognition that what happens in one state has an effect on water in others.

To the extent that you lessen water that is being taken out of natural systems in upstream states, there is more available downstream, not only for use by other consumers, but for use by wildlife and those natural systems that are dependent on water remaining in rivers and water remaining in the ground and water remaining in wetlands.

So we suggest that it is important that this legislation be enacted. We think you have a real opportunity to provide leadership. We would urge you to do so, not only for the human values that are concerned, but also the natural and wildlife values that are critical for the future health of our society.

Thank you, Mr. Chairman.
[The statement follows:]

STATEMENT OF PETER BERLE, PRESIDENT, NATIONAL AUDUBON SOCIETY

1 Time for action.

The National Audubon Society, with its 550,000 members, has a strong interest in water issues. Water is essential, not only to human health and enjoyment, but also to wildlife and natural ecosystems. The proposed National Plumbing Products Efficiency Act, with its potential to reduce household demand for water by 25%, represents a major step forward in improving the environment. With S-583, we have the opportunity to make more water available while protecting human health and natural habitats. All this, while saving money at the same time. Such a marvelous opportunity should not be turned down just because a special interest group may be inconvenienced.

When it comes to water issues, the United States is in the same position now that it was in prior to 1970 with respect to energy issues. Low fuel prices made energy seem like an unlimited resource. Energy conservation was thought to mean "freezing in the dark." It took two oil supply crises to trigger a change in attitudes. Ultimately, we learned that efficient use of energy resources was our cheapest and most environmentally desirable alternative. The National Appliance Energy Conservation Act of 1987 and the Amendments of 1988 provide some of the most dramatic examples of the changed attitude in the United States on energy. Passed with bipartisan support and the support of the appliance manufacturers, these bills establish minimum efficiencies for home appliances.

At some point, we are going to have to make similar changes in our thinking about water, and we are going to have to reduce our waste of this precious resource in our homes. If we are wise, we will make these changes sooner rather than later. We can no longer act as if supplies of clean water are unlimited.

Plumbing products installed this year will last for decades. Every year we delay the introduction of water-conserving equipment, we commit ourselves to 25-50 years or so of wasted water in buildings constructed during that year.

S-583 is an important step towards a national change in attitude towards saving water through improved efficiency. New irrigation technologies, for instance, provide even greater opportunity for saving water in a cost-effective manner than do innovations in the residential sector. Nevertheless, S-583 is a great start.

2 Importance of the proposed Act.

Passage of this Act will benefit human health. Many communities are forced to supplement their potable water supply with sources that are less than desirable. Filtering is never 100% effective and the addition of chlorine to control bacteria causes problems of its own. By reducing the overall demand for domestic water, S-583 will make it possible for those communities to draw a smaller percentage of their water from marginal and unhealthy sources.

Passage of the Act will also benefit wildlife, because it will help to reduce the number of dams that will be needed on rivers. When rivers are dammed up, the natural rhythms, caused by such phenomena as spring snow melt, are disrupted. Downstream habitat is often lost to those species that have evolved to depend on naturally variable flows. More often than not these days, it is municipalities that are the driving force behind plans for new dams. Such is the case with the proposed Two Forks dam in Colorado, which National Audubon and other conservation groups are battling. S-583 provides a better alternative for meeting the water demands of suburban Denver than this massive, expensive, and environmentally damaging project.

The water conservation standards contained in S-583 have been adopted by a number of states. For instance, New York recently passed a law similar to the proposed bill under discussion here today. One of the reasons behind the legislation was the desire to reduce the amount of Hudson River water that is added to the supplies of municipalities, such as New York City.

Even a state like Washington, the Evergreen State, is not immune to water shortages and has adopted efficiency legislation. Motivation for the law stemmed from concerns about shortages in Seattle in times of drought, as well as from the need to reduce the capacity of future water treatment plants that may be needed for protection of Puget Sound. In fact, there were serious water demands on rivers and aquifers throughout the state. It is not surprising, therefore, that Washington passed a plumbing products law.

Unfortunately, most states have not passed such far-sighted laws. Yet, every state has water problems of one kind or another that can be helped by products that conserve water at the point of use and therefore by the National Plumbing Products Efficiency Act. Some examples:

If this legislation is enacted, the State of Wisconsin will end up with a lower percentage of filtered water from Lake Michigan in its water supply. Not only will the quantity of toxics in the potable water supply be lessened, but combined sewage overflows will also be reduced.

In Virginia, passage of the National bill will reduce the water capacity requirements of treatment plants needed to treat wastes entering Chesapeake Bay. Those communities in Virginia that mix their water with a source of lower purity (e.g. Potomac river water) will benefit as well, by being able to back out some of the water of lesser quality.

A state like Kentucky will benefit because there will be less water demand for small municipalities to meet.

In an arid state like Arizona, water conservation is an especially wise practice. Already, several communities in the State have required 1.5-gallon-per-flush toilets and Phoenix is considering a similar standard. Passage of S-583 would extend the benefits of such measures to the whole state. As a result, federal and state dollars already invested in water projects will be stretched farther, postponing the day when any additional funds will be required.

3 Need for National Standards

As listed below, there are many practical and compelling reasons for passing a national bill, rather than relying on the states to enact their own individual laws.

1) There is a need for standardization in performance criteria and labelling. For instance, without action on a national level to keep nonconforming products off the market, enforcement at the state level will be more difficult.

2) State water supplies are often intertwined with those of other states. Conservation in neighboring states is therefore important. Without a federal law, some states will fail to enact any plumbing product efficiency law, some will enact a very weak one. Colorado, for example, has passed plumbing product efficiency legislation that is much weaker than S-583. As a result, Colorado will need to take more water out of the South Platte River system than it would need to take under S-583, thereby reducing the amount of river water that will reach Nebraska and the critical wildlife habitat there.

3) S-583 will reduce duplicative efforts in the states. It simply does not make sense for every state legislature to re-invent plumbing product efficiency legislation.

4) Passage of S-583 will send important messages to the plumbing manufacturers, to the public, and to local governments.

One message is that the United States must exploit the "water supply" made available through conservation before devising new development projects.

Second, the introduction of national standards will send a message to manufacturers that now is the time to put resources into developing innovative plumbing fixtures. Our experience with home appliances and the appliance industry suggests that the plumbing industry will respond with innovations if it knows that government is taking the water efficiency issue seriously.

4 Opposition to the Act

We regret that portions of the plumbing industry is opposing this legislation. No doubt, enactment of this legislation means some inconvenience for them. But the national interest is clear. The overall environment will be improved due to S-583. The economy will be helped by the dollars saved.

What happens if the industry is successful in defeating this legislation? The conservation community, along with water utilities, will have to go state by state, as was done initially with liance efficiency legislation. The industry will be able to k some states from passing efficiency laws, but we will cer- .nly get laws enacted in many states that do not presently have em. The end result will not be optimal. The country will get

a hodgepodge of laws with different labeling requirements, different standards, and difficulties with enforcement. And, like the appliance manufacturers in 1987, the industry will be back here before Congress in a few years begging for a national law to ensure uniformity.

Congress can circumvent this trouble by simply recognizing what's going on here today: a special interest group, with few allies, is asking to be spared the inconvenience of changing their ways despite a great public need.

Let me turn to Title II of the bill, the section which deals with dishwashers and clothes washers. This Section adds to the Department of Energy's existing responsibilities for setting standards in these appliances. Under S-583, DOE would have to set standards for saving water, not just for saving energy, when both savings can be made cost-effectively. Why is this important? There may well be methods to save cold water that DOE would not look at under the existing law because doing so would not save energy.

It is a surprise to see the Association of Home Appliance Manufacturers (AHAM) opposing Title II. I recall AHAM's opposition to similar provisions relating to energy in the mid-80s, but I thought they had been converted by their experiences in 1987 with the national appliance bill. I hope they will soon come around and see that the advantages of a national bill are just as great for water as for energy. Support for national legislation will save them another round of battles in state legislatures.

It's not as if the impact of this legislation would be immediate. Under Department of Energy time tables already in place for the energy component of dishwashers and clothes washers, the earliest the manufacturers would likely have to modify their models would be in 1998! This delay is expected because DOE is

likely to finish its energy rule-making for 1993 standards for these appliances prior to taking up water standards. Joint treatment of water and energy would then get pushed back to the rule-making aimed at 1998 standards. If any changes are to be made by this committee to Section II, it should be in the direction of requiring DOE to expedite engineering studies and rule-making, so as to bring the water standards into phase with the energy standards by 1993.

Some observers may worry that S-583 represents interference with the "free market." It does not. There is no free market in water. (In some areas there is no market at all.) Past government water subsidies have kept the price of water below free-market values. Either metering is nonexistent, the cost of water is marginally related to use, or the user does not pay the bill directly. Thus, consumers and municipalities are not getting proper signals as to the replacement costs of water. Cost-effective regulations are essential in such a situation. S-583 deserves passage by Congress.

Senator BRYAN. Mr. Berle, we thank you very much for your testimony.

Ms. Vickers.

## STATEMENT OF AMY VICKERS, PROJECT MANAGER, BROWN AND CALDWELL, CONSULTING ENGINEERS

Ms. VICKERS. Thank you, Mr. Chairman.

My name is Amy Vickers. I am a water conservation and water resources management consultant with Brown and Caldwell, Consulting Engineers, in Boston, Massachusetts.

I am submitting my formal written testimony for the record and I will give an oral statement.

What I would like to do is submit some statements of support from a number of water utilities around the country. The first one is a statement from New York City. We have a letter from the Lower Colorado River Authority in Texas. The California Municipal Utilities Association has submitted a statement. The Delaware River Basin Commission and the Las Vegas Valley Water District are also submitting a statement in support.

I think in many ways I represent a utility perspective on this issue because I have had quite a lot of experience with water resources management, both in New York City and in Boston, over the last four or five years. Up until very recently, I was a water conservation specialist with the Massachusetts Water Resource Authority in Boston, and during my two-year tenure there I earned the dubious distinction of being known as the "Commode Queen."

I earned this rather unique honor because I authored what came to be the 1.6 gallons per flush plumbing code amendment in Massachusetts. As a result of that successful effort, there has been a grassroots response all around the country in support of this concept.

We have four or five states now—New York, Connecticut, Rhode Island, the state of Washington, and now California on Monday—who have passed similar legislation in support of water efficiency standards.

Why is there this demand for this so-called "potty bill"? Well, it is for many reasons. Again speaking from the utility perspective, in Boston I can tell you that for a population of 2.5 million people the current water demand is 325 gallons of water a day.

Now, the sustainable yield for that system is 300 MGD. That system is 25 MGD over its safe yield. Long-term, the demand projections at the current rate of use go even higher.

Where is this additional water coming from? It is a good question. The bottom line is our reservoirs are going dry. All across the country this is a continuing trend.

What we found in Massachusetts is that by instituting water conservation measures, such as leak detection and repair, industrial conservation, and the use of water efficient fixtures, we can dramatically reduce the amount of water that is used systemwide, to a point where we can put our system back into equilibrium and ensure a sustainable yield of drinking water.

When you go through my written testimony, you will see many charts that I have prepared. I have done quite a lot of research in

this area. I have found, for instance, on the Massachusetts system, if every home in the Boston metropolitan area had a 1.5 gallons per flush toilet, a 2.5 gallon per minute showerhead, and a 2.5 GPM faucet, we could reduce our current demand by 60 million gallons of water a day.

That is a staggering amount of water savings from those simple conservation steps alone. That single step represents the most cost effective thing we can do for the MWRA to manage their water demand.

If we continue at the current rate of growth for that particular system, the cost of diverting the Connecticut River, which is our only available source of supply, will be an estimated $600 to $700 million, just for building the infrastructure to do that task. That is not including the extra costs for operating and maintaining that system. That is not including the additional costs for operating and maintaining and expanding the waste water treatment facilities, which are already costing us $6 billion.

Going back again to the fixtures, the current toilets which are now on the market, the 3.5-gallon standard toilet, uses anywhere from 16,000 to 25,000 gallons a year for an average household. A 1.6 for an average household of 3.2 people uses 7,000 gallons of water a year, rather. That is a 70 percent savings.

There are similar savings for showerheads, faucets, and urinals as well.

The bottom line is, if we have this legislation the average household water use would drop 40 to 65 percent. That is just a staggering amount of water when you start multiplying it across a system or across the country.

Again, I think there is a tremendous national trend for this legislation. Our population and demand for water is going up, but the bottom line is that nature's hydrologic budget is fixed and charges us a hard price for waste, both its impact on the environment and its impact on our ratepayers, who must pay for the costs of wasting water.

What I see as an expert in this field is that water efficiency is the only way to ensure sustainable water supplies. I think when we are talking water conservation what we are really saying is better management of the resources we have.

I think the old idea of managing water was that this resource was in great abundance. The world has changed now. That is no longer the case. We have serious water supply and water contamination problems that must be addressed by better efficiency.

As many people have mentioned, the avoided cost in waste water and water supply systems is very dramatic. I would mention that there are many case studies on this. The City of San Jose recently retrofitted their plumbing fixtures, their showerheads, their toilets, et cetera. They have saved, I think they projected, 12 million gallons of water a day.

Long term, because of that single conservation measure of using water efficient fixtures, San Jose has estimated they will avoid having to spend $65 million in additional costs for waste water treatment expansion. Again, that is one city in this country. We can multiply that across the nation.

What I would like to talk a little bit about is some of the performance issues on these fixtures that have come up. I have seen a lot of change over the last two years since Massachusetts began requiring the 1.6.

What we have now are all the major manufacturers producing 1.5 gallons per flush toilets. Overall, I think they are very excellent fixtures. I think they meet or exceed the performance standards that we see on the 3.5 or higher consumption toilets. This is evidenced, I think, by the growing demand for these fixtures in the New England area. As I said, the other states are now requiring these fixtures as well.

One good example of a facility which has actually used these fixtures is the Lenox Hotel in Boston. It is a 220-room turn of the century hotel. The Lenox is a very water-conserving hotel. They went in and replaced every fixture with water conservation fixtures.

Since they did that last December, their water consumption has dropped by 40 percent. They are estimating that for 1989 alone they will save over $15,000 on their water bill alone, not including the energy costs as well.

I am seeing fixtures which work very efficiently. The bottom line is that low flow toilets are being installed, and they are working. There is not one piece of evidence that I have seen anywhere which has ever documented that there is a problem transporting solid wastes down a drain line from low flow toilets. There simply is no evidence to support that.

In fact, low flow toilets are being installed all across the country as interest in saving water continues to grow. The U.S. is the last industrialized nation in the world to use these fixtures.

The last thing I would like to do is just mention one amendment which I think is important to this legislation. On the standard for the showerheads, it is very important that we insert into the bill a provision that would prohibit removable flow restrictors for the showerheads.

This is a problem in some areas where manufacturers and sometimes the public occasionally tries to overstep the flow rate and water savings of a particular fixture by tampering with it. There are many excellent tamperproof showerheads on the market that provide the public with excellent performance. Thank you.

[The statement follows:]

STATEMENT OF AMY VICKERS

INTRODUCTION

Mr. Chairman and members of this subcommittee, I would like to thank you for the opportunity to appear before you today to testify in enthusiastic support of S.563/H.R.1185, "The National Plumbing Products Efficiency Act of 1989."

I will tell you a little bit about my experience and background because I think that it is relevant to the issue of water conservation and how this legislation has come to be presented here today.

I am a water conservation and water resources management consultant with Brown and Caldwell Consulting Engineers in Boston, Massachusetts. I also have the dubious distinction of being known as the "Commode Queen." I began acquiring this rather unique honor while working at the Massachusetts Water Resources Authority (MWRA) when in 1988 I set a national precedent by authoring what came to be the new Massachusetts state plumbing code to require "low flow" toilets which use no more than 1.6 gallons per flush (gpf), thereby replacing the previous standard of 3.5 gpf. I have also had an active role in helping to formulate the bill you have before you today because of my experience with this issue in Massachusetts and on the national level. Before I worked at the MWRA, I was the Director of the Environmental Protection Committee for the New York City Council where I worked on a range of water supply and environmental issues. I have an M.S. in Engineering Sciences from Dartmouth College, and B.A. in Philosophy from New York University. I am an active member of the American Water Works Association (AWWA), the American National Standards Institute (ANSI), the American Society of Mechanical Engineers (ASME), and the Massachusetts Audubon Society.

A National Water Crisis is Looming

It seems like hardly a day goes by anymore that there is not some lead story in the news about water -- water shortages, water contamination, drought, conflict over rights to water, the cost of water, and on and on. Once relegated to the desert regions of the western United States, these problems are now all too commonplace in the "water rich" eastern U.S. as well. From Boston and New York City to Atlanta and Miami, virtually every major urban area east of the Mississippi River is now grappling with the troubling problem of ensuring an adequate and safe supply of water to meet the demand for this essential resource that had once seemed to be in such abundance. As the U.S. Congressional Budget Office has found, by 1990 it is estimated that 170 of the nation's 756 large urban water supply systems will need additional supplies to meet the demands of our ever-expanding population and increased water needs.[1]

Despite our continued thirst for more water, nature's hydrologic cycle maintains a strict budget which charges us a hard price for waste. Developing "new" water supplies to meet our continuing growth assumes that additional water supplies are easily available, and that major capital expenditures are equally in abundance. Nothing could be farther from the

truth! Acquiring new supplies of clean water more often than not means stealing it away from someone else who would like it too, if they're not already using it. Growing water contamination is also rapidly claiming away too many of our drinking supplies and is further aggravating the demand for new water sources. And in an era of weak or nonexistant federal support for capital resource and infrastructure improvements, few taxpayers are willing or able to support the exorbitant cost of paying for such development themselves.

Clearly, as population and global warming trends continue to shift water demand and deficits upward, it is increasingly apparent that the traditional supply-side solutions to develop additional supplies are fast becoming environmentally, economically, and politically infeasible. In order to ensure sustainable water supplies in America's future, we must begin to respond now to today's water shortages by attacking the demand side and tapping conservation as the new and most cost-effective supplier of choice.

## Grass Roots Demand for Water Conservation Legislation

In 1988, Massachusetts set a national water conservation precedent by amending its state plumbing code to require the use of low volume toilets which use a maximum of 1.6 gallons per flush (gpf), thereby replacing the previous standard of 3.5 gpf. This measure was taken as a means to help reduce a growing water demand that is threatening to exceed the sustainable yield of several water supply systems in the state. As a result of that initiative, other states, cities, and regions concerned about their water supplies - Rhode Island, New York, Connecticut, and Washington, as well as New York City, Los Angeles, and the Delaware River Basin Commission (which serves parts of New York, New Jersey, Delawre, and Pennsylvania) - have followed Massachusetts' lead by enacting laws or codes to require the use of 1.6 gpf toilets in order to achieve water savings in their jurisdictions as well. Other states and localities across the country such as California and Florida are also now seeking to pass similar measures as well.

Clearly, if there was ever a call for a national mandate on water conservation, the states are making it now.

My testimony today will present my research on the dramatic water savings potential from the proposed water use efficiency standards on the typical household and U.S. water budgets. A case study of the Boston metropolitan area's water supply system will be presented as an example of the potential water supply impact of this far-reaching water conservation proposal. The performance aspect of low volume plumbing fixtures will also be discussed since I have had considerable experience with this matter and because I believe that there is ample evidence to demonstrate that it is really not an issue and should not concern this legislation. Finally, I will present some of the key environmental and economic benefits tof this bill which should also be considered in evaluating its merits.

**Conventional Plumbing Fixtures Waste Water**

Conventionally designed plumbing fixtures and appliances are our worst culprits when it comes to the needless and daily waste of water, and yet their relationship to water consumption has been largely ignored by water supply planners and the plumbingware industry. Up until the last twenty years, most indoor plumbing fixtures had been designed with little thought as to their efficiency of water usage and flow.

Few consumers are even aware of how much water their plumbing fixtures actually use. Figure 1 represents a prototype "Water Use Guide" label that I developed, much like the current "Energy Use Guide" required by federal law on electrical appliances, that would be required by this legislation. Such labels would be an important first step in educating the public about their water use and the price they pay for such consumption.

Figure 1

Toilet
(Gravity Tank Type)

Commode Corporation
Model #12345
3.5 gallons per flush (gpf)

# WATER USE GUIDE

| Model with lowest water & sewer cost | THIS MODEL | Model with highest water & sewer cost |
|---|---|---|
| $17 | $41 | $77 |
| ▼ | ▼ | ▼ |
| Estimated yearly water & sewer cost | | |
| 7,000 gallons | 16,400 gallons | 32,700 gallons |

Your cost will vary depending on your local water and sewer rates and how often you flush your toilet. This cost is based on an average toilet use rate for a 3.2 person household.

## How much will this model cost you to run yearly?

| | Yearly Cost | | | |
|---|---|---|---|---|
| Average daily number of flushes | 4 | 8 | 12 | 16 |
| Estimated yearly water & sewer cost | | | | |
| Cost per 1,000 gallons 50¢ | $8 | $16 | $24 | $32 |
| $1.00 | $17 | $34 | $51 | $68 |
| $1.50 | $25 | $50 | $75 | $100 |
| $2.00 | $33 | $66 | $99 | $132 |
| $2.50 | $41 | $82 | $123 | $164 |
| $3.00 | $49 | $98 | $147 | $196 |

Ask your salesperson or local utility for the water and sewer rate in your area. Your cost will vary depending on your local water and sewer rate and how you use the product.

IMPORTANT: Removal of this label before consumer purchase is in violation of Federal law.

The proposed water use efficiency standards in the Atkins-Fowler bill, as shown in Table 1, are realistic and practicable since fixtures meeting such standards are now commercially available throughout most of the U.S. These proposed standards sharply contrast with the current water use standards for plumbing fixtures, largely established by the plumbingware industry, which are now widely installed throughout the U.S.

If the proposed maximum water use standards for plumbing fixtures are adopted, the U.S. will become one of the last of the world's major industrialized nations to use water efficient plumbing fixtures, thereby following Japan, Scandinavia, as well as parts of Europe and Central and South America which have been using water efficient fixtures for the past 20 years.

## Potential Savings to the Typical Household Water Budget

The estimated water savings to the typical 3.2 person household from the use of low volume toilets, showerheads, and faucets can be considerable, depending on the flow rate of currently installed fixtures. The breakdown of these savings by fixture category is detailed below.

**Toilets.** A water efficient 1.5 gpf toilet uses an estimated 7,000 gal/year in the typical household, but the current average toilet in the U.S. uses from 3.5 to 7.0 gpf and accounts for 16,400 to 32,700 gal/year in domestic water usage, approximately 38 percent of the household water budget.[4] By replacing a conventional 3.5, 5.0, or 7.0 gpf toilet with a 1.5 gpf fixture, the typical household can reduce its water demand by an estimated 9,400 gal/year to 25,700 gal/year, as shown in Figure 2*. These reductions would yield savings from 57 to 79 percent in that use category.

* Although the proposed standard would require toilets to use no more than 1.6 gpf, calculations are based on 1.5 gpf, the flow rate at which most low volume toilets operate.



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Table 1

CURRENT & PROPOSED
WATER USE BY PLUMBING FIXTURES

| FIXTURE | Current [1] Water Use (gallons)* | Proposed [2] Maximum Water Use (gallons)* | Effective Date |
|---|---|---|---|
| • Toilet | 3.5 - 7.0 gpf | 1.6 gpf | 1/1/92 |
| • Showerhead | 3.0 - 8.0 gpm | 2.5 gpm | 1/1/91 |
| • Kitchen Faucet (& replacement aerators) | 2.75 - 7.0 gpm | 2.5 gpm | 1/1/91 |
| • Lavatory Faucet (& replacement aerators) | 2.75 - 7.0 gpm | 2.0 gpm | 1/1/91 |
| • Urinal | 1.5 - 5.0 gpf | 1.0 gpf | 1/1/91 |

Notes

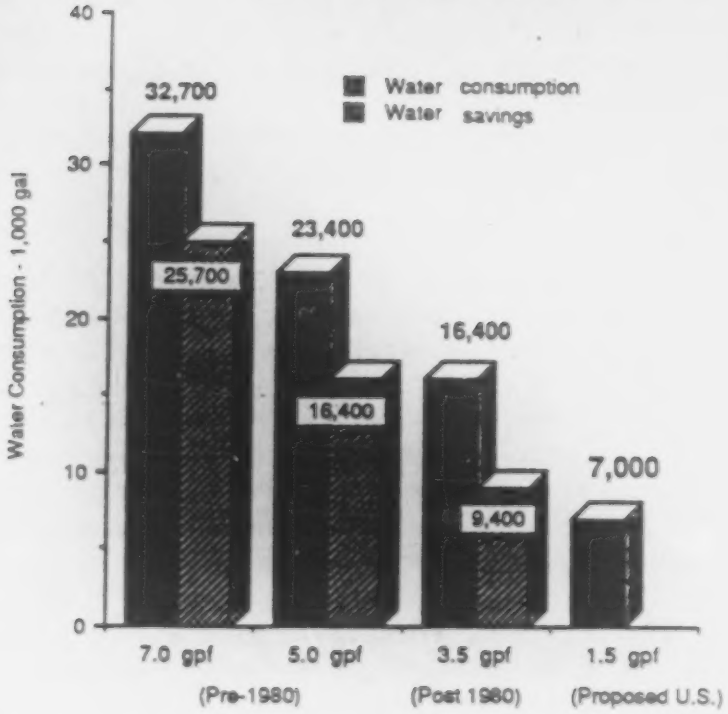
1. Varies by state and local jurisdiction.
2. Based on proposed "National Plumbing Products Efficiency Act of 1989"

* gpf = gallons per flush; gpm = gallons per minute.

Figure 2

Annual Household Water Savings

With 1.5 gpf Toilet Retrofit




Existing Toilets

Note: Assumes 4 flushes per person per day for a 3.2 person household

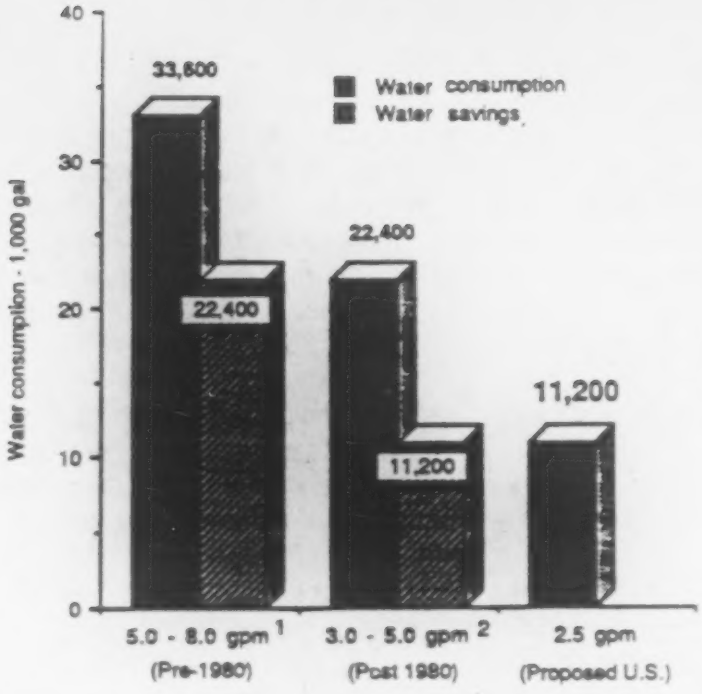
The projected water savings for toilets are consistent with findings from an in-house pilot study by researchers at the University of Wisconsin at Madison,[5] as well as those of a field study in Phoenix, Arizona by Anderson and Siegrist.[6] In the Madison study, it was found that homes retrofitted with toilets using between 0.5 and 1.4 gpf saved as much as 75 percent on their daily indoor water use per day compared to the typical home which had a per capita use rate of 45 gallons per capita day (gpcd). In the Phoenix study, 250 homes with 0.8 gpf toilets were compared with homes with conventional toilets. It was found that the homes with 0.8 gpf toilets used 19 - 28 percent less water per month than those with conventinal units.

These estimated savings are also probably conservative since they asume an average of only four flushes per person per day. The assumption of four flushes per person per day is based on a 1984 survey of household water use by the U.S. Department of Housing and Urban Development (HUD).[3] Also, a flush rate of four per person per day is low compared with that used by Preston.[7] Anderson and Siegrist estimate that the average American uses about 9,000 gal of water to flush 130 gal of body waste, which equates to an average of five to seven flushes per day with a conventional toilet, a higher water consumption rate.

**Showerheads.** A water efficient 2.5 gallon per minute (gpm) showerhead uses an estimated 11,200 gal/year in the typical household, but the current average showerhead in the U.S. uses from 3.0 to 8.0 gpm and accounts for 22,400 gal/year to 33,600 gal/year in domestic water usage, approximately 22 percent of the household water budget.[4] By replacing a conventional 3.0 - 5.0 gpm or 5.0 - 8.0 gpm showerhead with a 2.5 gpm fixture, the typical household can reduce its annual water demand from an estimated 11,200 gal/year to 22,400 gal/year, as shown in Figure 3. These reductions would yield water savings from 50 to 67 percent in that use category.

## Figure 3

**Annual Household Water Savings* With 2.5 gpm Showerhead Retrofit**




**Existing Showerheads**

Notes

1. Assumes an average flow rate of 6.0 gpm
2. Assumes an average flow rate of 4.0 gpm

* Assumes an average 4.8 minute shower per person per day per 3.2 person household

The household water use rates and projected savings for showerheads are based on an average per capita showering time of 4.8 minutes per capita daily, as determined by the HUD study.[3] Such estimates could vary significantly depending on individual usage and fixture flow rates.

**Faucets.**** A household with a water efficient 2.5 gpm kitchen faucet and a 2.0 gpm lavatory faucet uses an estimated 11,700 gal/year, but the current average kitchen and lavatory faucets use from 2.75 to 7.0 gpm and account for 14,600 to 23,400 gal/year, approximately 15 percent of the household water budget.[4] By replacing the average kitchen faucet with a 2.5 gpm fixture or a lavatory faucet with a 2.0 gpm fixture, the typical household can reduce its water demand from 2,900 gal/year to 11,700 gal/year, as shown in Figure 4. These reductions would yield water savings from 20 to 50 percent in that use category.

These household water use rates and projected savings for faucets are based on an average per capita flow rate of 5.0 minutes per capita per day. Such estimates could vary significantly depending on individual usage and fixture flow rates.

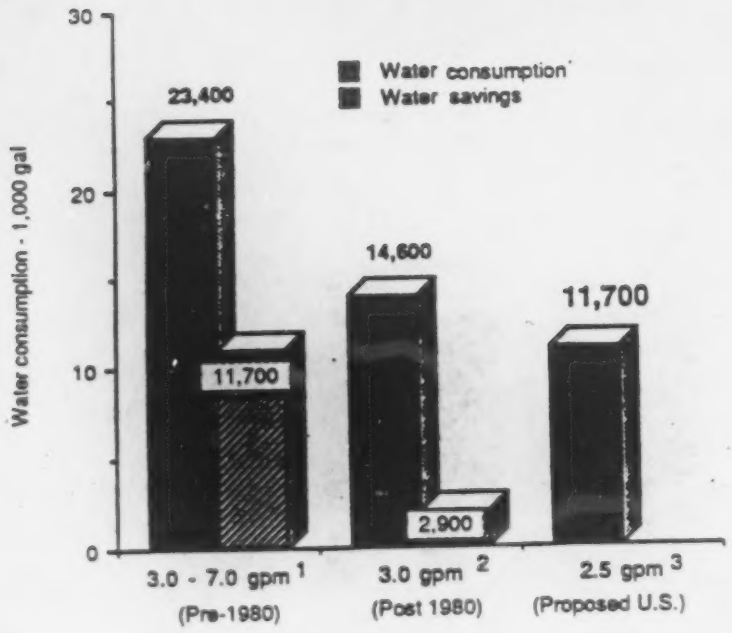
**Reduced Household Water Budget.** The total estimated annual household water savings from a retrofit of conventional toilets, showerheads, and faucets as discussed earlier is 23,500 gal/year for fixtures installed after 1980 to 55,100 gal/year for fixtures installed before 1980, as shown in Figure 5. (Please note that the estimated water savings for pre-1980 toilets are an average of both the 5.0 and 7.0 gpf fixtures - approximately 27,900 gal/year) Such savings would create a new household water budget of 29,900 gal/year - a savings of 44 to 64 percent over the present estimated household budget of 53,400 to 85,000 gal/year for a household with conventional, high water use fixtures.

** I have assumed that "faucets" include both kitchen and lavatory faucets since, at the time of this writing, there is no reliable or confirmed estimate of the number of kitchen faucets separate from the number of lavatory faucets currently installed in the U.S. It is also assumed that both faucets together use an average of 3.0 gpm for "Post 1980" faucets; although the more recent "Post 1980" fixtures use an average of 2.75 gpm, the majority of faucets manufactured and installed after 1980 use 3.0 gpm.

**Figure 4**

**Annual Household Water Savings***

**With 2.5 gpm Faucet Retrofit**




Existing Faucets

Notes

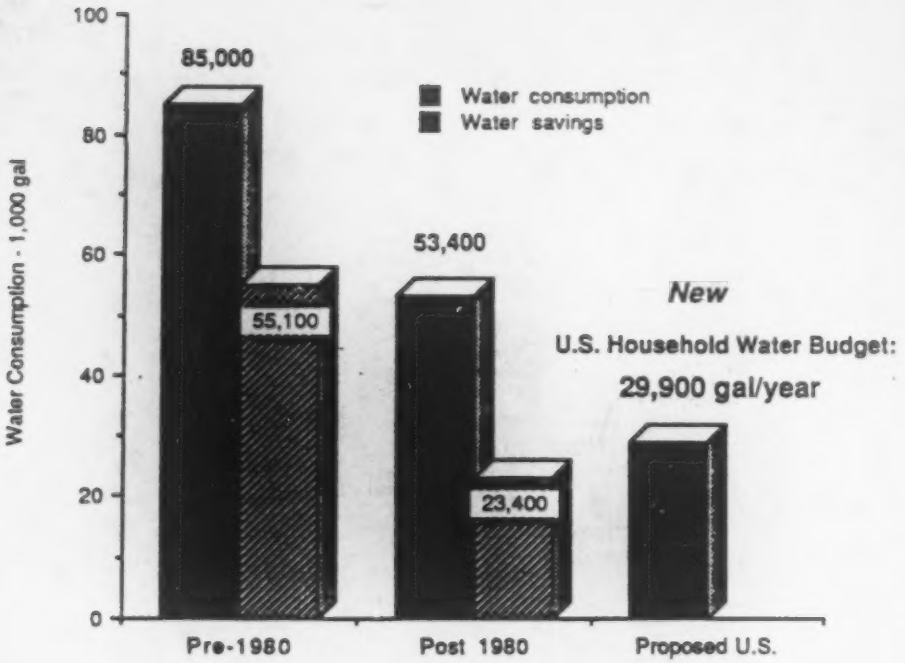
1. Assumes an average flow rate of 4.0 gpm
2. Assumes an average flow rate of 2.5 gpm
3. Assumes an average flow rate of 2.0 gpm

* Assumes an average of 5 minutes of faucet use per person per day per 3.2 person household

Figure 5

Annual Household Water Savings

With Toilet, Showerhead, & Faucet Retrofit




Existing Toilets, Showerheads, & Faucets

These figures are based on average use rates for an estimated inventory of plumbing fixtures currently installed in the U.S. Based on the estimated current stock of installed toilets, showerheads, and faucets in the U.S., the establishment of the proposed national water use efficiency standards would decrease current household water demand from these fixtures by an average of 63 percent, 46 percent, and 26 percent respectively. In terms of projected total household water savings with such a fixture retrofit, the new household water budget for toilets, showerheads, and faucets would drop down to 29,900 gal/year. This demand reduction represents a household savings of 55,100 gal/year (from 85,000 gal/year), or 65 percent, for fixtures installed before 1980, and 23,500 gal/year (from 53,400 gal/year), or 44 percent, for fixtures installed after 1980.

## Nationwide Water Savings Potential

Based on an estimated 1990 U.S. population of 250 million people, the potential savings from water efficient plumbing fixtures to the nation's water budget represent substantial "additional" supplies to serve new populations or supply systems with needs that currently exceed their safe yield, perhaps those estimated by the U.S. Congressional Budget Office to be in need of new supplies. With an estimated total U.S. daily water consumption of 45.75 bgd, based on a national average of 183 gpcd, the total current U.S. daily water consumption by the three major plumbing fixtures accounts for an estimated 13.9 billion gallons a day (bgd), or 30 percent, as illustrated in Table 2.

Given a total replacement of all existing toilets, showerheads, and faucets with their water efficient counterparts, the estimated savings would reduce the current U.S. water budget by 6.8 bgd, down to 39.0 bgd. This reduction represents a 15 percent savings in total U.S. daily water demand. A national water demand reduction of 6.8 bgd would equal a daily per capita savings of 27.2 gallons a day. This would effectively reduce the current average U.S. daily per capita demand from 183 gallons down to 156

Table 2

## CURRENT DAILY WATER USE & PROPOSED REDUCTIONS BY PLUMBING FIXTURES*

(Estimated)

| | U.S.† | | | MWRA†† | | |
|---|---|---|---|---|---|---|
| Fixture | Current Demand (bgd) | Proposed Demand (bgd) | Demand Reduction (bgd) | Current Demand (mgd) | Proposed Demand (mgd) | Reduction (mgd) |
| • TOILETS[1] | 6.2 | 2.2 | 4.0 | 56.5 | 22.5 | 34.0 |
| • SHOWERHEADS[2] | 4.4 | 2.4 | 2.0 | 44.4 | 24.0 | 20.4 |
| • FAUCETS[3] | 3.3 | 2.5 | .8 | 32.4 | 25.0 | 7.4 |
| TOTAL: | 13.9 | 7.1 | 6.8 | 133.3 | 71.5 | 61.8 |

Notes

1. Assumes 6 flushes per capita per day.
2. Assumes 4.8 minutes showering per capita per day, at normal pressure.
3. Assumes 5 minutes of running faucet per capita per day, at normal pressure.

* Based on an estimated current stock of installed fixtures with an average flow rate for a range of fixture sizes.

† Based on an estimated U.S. population of 250 million people, using an estimated 45.75 billion gallons

gallons, again a 15 percent savings. This would also reduce the daily household per capita consumption from 77 gal/day to 50 gal/day, a 35 percent savings. With a new daily per capita demand of 156 gallons, the avoided demand of 6.8 bgd would serve an additional 43.6 million people in 1990- if the proposed bill was in effect with 100 percent complying fixtures installed by 1990.

If the Atkins-Fowler bill is passed into law with its water use fixture efficiency standards implemented as proposed (1992 for toilets, and 1991 for showerheads and faucets), it would take approximately twenty years to replace all existing high volume fixtures and realize the total or near total system savings projected in Table 2 by the year 2012. This estimate is based on an average annual fixture replacement rate of approximately 5 percent.[8]

Based on a U.S. Bureau of the Census population projection of 288.9 million people for the year 2015 [9] (more than three years past the normal fixture replacement date for all fixtures which have lived out their average lifetime and been replaced), and with an projected average daily consumption of 156 gpcd, the nation's water budget would be 45.1 bgd - the estimated water budget during the years between 1985 to 1990 when the U.S. had a population of 239 to 250 million people. Without the projected water savings from passage of the Atkins-Fowler bill, the nation's water budget can be expected to rise to 52.9 bgd in 2015, over 7.8 bgd over what would be needed with water efficient fixtures. This projected increase may also be low since it does not reflect any increased rate of change in water demand (which has been documented since 1960).[9]

Finally, the savings projections to U.S. total and per capita daily demand from the fixture standards proposed in the Atkins-Fowler bill are conservative and understated because they assume water consumption rates by fixtures for household use alone - they do not count per capita water use from toilets, showers, and faucets in non-domestic sectors, such as places of employment, offices, commercial establishments, public and private institutions, etc.

## Case Study: Metropolitan Boston Water Supply

Like many regions throughout the U.S. which are experiencing a growing demand for more water, Massachusetts has long weathered its share of "water wars" and river diversion debates over whether the western part of the state should continue to supply the ever-increasing demands of metropolitan Boston. Currently, average water demand by the 2.1 million people in that region who are served by the Massachusetts Water Resources Authority from the Quabbin Reservoir in central Massachusetts is 324 mgd, thereby exceeding that system's safe yield of 300 mgd. (The entire MWRA system serves 46 towns and cities with a total of 2.5 million people and an average total daily water demand of 405 mgd; the balance of supply is made up by locally owned sources).

The estimated daily water savings achievable from a complete fixture replacement in the MWRA service area, assuming a 100 percent saturation rate, is 61.8 mgd, as shown in Table 2. This represents a 15 percent system-wide demand reduction, and would provide more than an adequate supply of additional water to meet the current 24 mgd deficit threatening that supply. Since Massachusetts already requires the use of 1.6 gpf toilets, the anticipated water savings from those fixtures alone is expected to result in an estimated demand reduction of 34 mgd by the year 2010, representing a system-wide demand reduction of 8 percent.

**Boston's Lenox Hotel.** A good example of *actual* savings which have been achieved from the use of water efficient plumbing fixtures is already being demonstrated by Boston's historic Lenox Hotel. Simply by installing low flow 1.5 gpf toilets, 2.5 gpm showerheads, and 1.5 gpm faucet aerators in its 220 guestrooms, this turn of the century establishment has reduced its average water demand by an estimated 40 percent, or 300,000 gallons a month, with a projected savings of approximately 3.6 million gallons of water and an estimated $15,000 on its water and sewer bill for 1989 alone. These savings have been achieved with no reduction in fixture performance, consumer satisfaction, or wastewater flow problems.[10]

**Princeton (N.J.) Community Housing Corporation.** In an example of retrofitting a public building with low-volume toilets, the non-profit Princeton (N.J.) Community Housing Corporation achieved substantial savings in water and sewer costs by retrofitting an 88-unit building with 0.8 gpf ultra low volume (ULV) toilets at a net installation cost of $28,000 (this figure includes savings from a reduced sewer hook-up fee). The corporation has saved $9,100 annually in water and sewer costs since the building was retrofited three years ago. It is in the process of retrofitting another 238 unit development at an estimated cost of $68,000, with projected annual savings in water and sewer costs of $30,000. The corporation is also installing low flow toilets in a new 280 unit development.

## Performance of Low Volume Plumbing Fixtures

To date, there have been countless installations of low volume plumbing fixtures throughout the United States -- without any difficulties outside of the normal problems that can occur with any plumbing fixture.

The performance "issue", which some industry representatives have cloaked around this legislation, is really a *market* issue. As a result of new code and legislative requirements for 1.6 gpf toilets that have quickly become enacted since 1988, particularly in the New England region, certain plumbingware manufacturers who once dominated the market for 3.5 gpf toilets have become rapidly overtaken by smaller manufacturers who have proven 1.6 gpf toilets to take their place. Some of the larger plumbingware companies have begun to lose their market lead (and profits) to the smaller chinaware companies as a result of this situation. At this point, every leading plumbingware manufacturer has at least one 1.6 gpf fixture available on the retail market. If such products did not adequately perform, how could the plumbingware industry be successfully marketing and selling their products?

I will briefly outline what has been the public's *actual* experience with low volume fixtures.

• **Showerheads.** The 3.0 gpm showerhead is currently the national standard, although higher consumption showerheads are easily available on the market. A number of retrofit programs have used 2.5 gpm showerheads *and lower* without performance complaints or reports of scalding. Such programs have been conducted in a number of cities and localities, including Metro-Boston, MA., Phoenix, AZ., San Jose, CA., Austin, TX.

• **Faucet Aerators.** Many of the pilot retrofit programs, such as those mentioned above, have also used faucet aerators to help reduce water consumption. The Lenox Hotel in Boston has successfully installed a consumer-acceptable aerator which uses only 1.5 gpm, a consumption rate below the 2.0 gpm (lavatory) and 2.5 gpm (kitchen) standards proposed in S.583/H.R.1185.

• **Urinals.** A 1-gallon flushometer valve for urinals has been commercially available and in-use for several years. Most new urinals installed at this time use flushometer valves set for either 1.0 gpf or 1.5 gpf.

• **Toilets.** Today's low flow toilets which use less than 1.6 gpf are the result of more than a decade of design innovations by the plumbingware industry. These new, efficient toilets meet or exceed current performance standards for the 3.5 gpf units, which have been mareketed as "water saver" toilets. The performance of low flow toilets in laboratory and field applications has been well documented by Konen[11], Galowin[12], Anderson, and Siegrist, for over a decade. These studies have all consistently shown that the improved and innovative features of the low volume toilets allow them to perform as well or better than the 3.5 gpm models.

Common performance questions raised about low flow toilets fall into three categories and are addressed as follows:

1. **Double flushing.** Concern about double flushing requirements for today's low flush toilets is unsubstantiated. *All* toilets require double flushing from time to time due to personal factors or improperly operating fixtures. The Phoenix study found that the incidence of multiple flushing and toilet clogging was much lower for the low flow toilets in the 250 home subdivision compared to the 650 home subdivision with 3.5 gpf toilets (15 percent vs. 65 percent, respectively).

2. **Dirty Bowls.** Toilets with a small water surface area ("water spot") in the bowl may require more cleaning than bowls with larger water surface areas. Some low flow toilets, especially those of European design, tend to have a smaller water spot than the American-made fixtures. The Phoenix study did find an increase in the bowl cleaning requirements for the ULV (0.8 gpf, not 1.6 gpf) toilets over the conventional units. Anderson has also found that toilets with smaller water areas are no less sanitary thatn those with larger water surface areas.

3. **Sewage Stoppages.** No evidence exists to support the hypothesis that less water accompanying the passage of solid wstes through sewer lines results in stoppages or other wastewater flow problems. Professor Thomas P. Konen, Director of the Building Technology Research Lab at the Stevens Institute of Technology in Hoboken, New Jersey, has addressed this issue as well. Konen and DeYoung concluded that no solids-transport problems should result from the use of low volume toilets based on their findings that:

- the low volume toilets they studied provided a wastewater velocity of no less than 3 ft per second (fps), which betters the accepted velocity minimum of 2 fps. In general, a velocity of 2 fps is sufficient for residential wastes and is the required velocity in most plumbing codes;

- The *normal* wastewater flow in sanitary sewers is unsteady and not uniform;

- small reductions in total wastewater volume do not alter the biochemical oxygen demand (BOD) of sewage (i.e., sewage treatment plants should not be adversely affected by the widespread use of low volume toilets), and

- "The velocity of the discharged water in the fixture drain is not appreciably different for the water closets tested. No problems with transporting solids are envisioned in fixture drains" from the use of low volume toilets.

Dr. Lawrence J. Galowin of the National Institute of Standards and Technology (formerly the National Bureau of Standards), National Engineering Laboratory, has also found that the movement of flushed solid wastes from toilets occurs in discrete steps, even with toilets which use 3.5 gpf or more. One flush alone, he reports, will not move solid waste from a toilet bowl to the public sewer main, especially if the service line is longer than 60 feet and minimally sloped; the passage of other wastewater, such as that from successive flushes, or showers, sinks, and washing machines can be needed to ensure complete movement of wastes.

Based on their work in Phoenix, Anderson and Siegrist concluded that 0.8 gpf toilets perform as well as or better than conventional toilets, that the occurrence and magnitude of peak wastewater flow conditions in the subdivision with low volume toilets was similar to that of the subdivision with conventional toilets, and tha wastewater composition in the subdivision with low volume toilets was within the typical range for municipal wastewater. "The waste flushing and transport through the household plumbing systems, building sewers and sewer mains where ultra low volume toilets were utilized was as satisfactory as where conventional toilets were utilized."

## ANSI Standards

The American National Standards Institute (ANSI) sets voluntary performance standards for toilets. The Massachusetts Plumbing Board requires all toilets installed in the state to be certified according to ANSI standards, each of the fifteen (15) low flow toilets approved by the Massachusetts Board have passed the same ANSI performance tests as required for the 3.5 gpf water closets under the old code.

## Related Benefits & Avoided Costs

As with all water conservation measures, the water and related cost savings potential from the installation of low volume plumbing fixtures can be far-reaching and profound. Such savings accrue not only to the direct user in the form of reduced water and sewer bills, but to the water supply and wastewater system as a whole. In evaluating the potential savings from the proposed National Plumbing Products Efficiency Act of 1989 , the benefits on the other side of the equation - to the wastewater system and related costs - should also be assessed. The impact of water conservation extends much farther than the tap; a host of infrastructure, natural resource, and related cost benefits can also be appreciated:

**Avoided System Costs**. Reduced water demand results in reduced water supply needs and the associated capital investments and operating costs for the infrastructure that is necessary to maintain and expand existing facilities or provide new supplies. Similarly for the wastewater treatment and distribution system, reduced water demand automatically reduces corresponding wastewater volumes and the associated energy, chemical, material resources, and related economic costs for its collection and treatment. Future water supply and wastewater treatment and distribution facilities could be downsized once per capita demand has been premanently lowered. Reduced volumes of water and wastewater would also result in less wear and tear on system

facilities, thereby prolonging the value and life of the system and its infrastructure. Such cost savings could be better utilized to help stabilize utility costs and upgrade existing facilities.

**Water Quality**. Long overlooked and underestimated, water conservation is inextricably linked to the preservation of water quality, particularly for ground water supplies which are drawn from aquifers through wells. By reducing water demand and decreasing the rate at which ground water is pumped, the rate of infiltration of such contaminants as saltwater, septic leachate, leaking underground storage tanks, hazardous wastes, and other pollutants into an aquifer and therefore drinking water can also be reduced. Slowing this rate of infiltration could have a significant impact on the potability and longevity of a ground water supply system serving public drinking water needs.

**Septic Systems**. The life of an overloaded septic system on the verge of failing can be extended by reducing wastewater effluent volumes with reduced water use, thereby delaying or avoiding the need to expand existing drain fields. New septic systems can also be downsized, thereby preserving land area and reducing system installation costs.

**New Building Construction Savings**. Construction costs for plumbing in new homes and buildings could be reduced by downsizing water and sewer service lines because of reduced water and wastewater volume loads on buildings.

**Sustainable Growth**. Throughout history it has been shown that the maintenance of a prosperous and healthy civilization hinges, in part, on its ability to supply a clean and sustainable water supply to its people. Water saved is water earned. The conservation of water is insurance for future prosperity and continued growth because it balances supply with demand, thereby making it a renewable resource. Every new home or building equipped with water efficient plumbing fixtures can, by reducing its water and wastewater loads, potentially provide enough "additional" water supply and wastewater capacity to sustain future development without overburdening its existing systems.

**Public Education.** S. 583/H.R. 1185 also has an important consumer education component that would require plumbing fixture marking and labeling requirements, modeled after the federal "Energy Use Guide" label that is required on all electrical appliances, in order to better guide the public on the water demands and costs associated with plumbing products. As discussed earlier, Figure 1 represents a model "Water Use Guide" which I have designed as a prototype for this label.

**Water Use Database.** S.583/H.R. 1185 would establish a national water use database to more accurately track the nation's water demands and needs, particularly as they relate to the use of plumbing fixtures and appliances. This information would be of great use to water supply professionals who must estimate the benefit/cost relationship of implementing water conservation programs.

## Conclusions

The estimated potential nationwide water savings from the proposed "National Plumbing Products Efficiency Act of 1989" are no less than staggering, and they could have a profound impact on the nation's water supplies and related wastewater systems if such legislation is passed into law. Simply by changing plumbing fixture standards to be more water efficient, the American public could dramatically reduce its water demand and the related water supply and wastewater system, environmental, and economic costs to provide this critical resource. Moreover, these savings represent demand reductions that are substantial and permanent. In some cases, such savings may represent additional supplies that could not be achieved by any other source. Such savings also represent critical additional resources to respond to an ever growing reality: increasing populations and a corresponding need for a vital resource which is fundamental to the preservation of life.

Unlike some environmental problems which require complex technological changes and innovations for solutions, the protection and conservation of water supplies can often be easily accomplished through direct and inexpensive methods of demand reduction, such as the use of water efficient plumbing fixtures. In addition to a baseline national water conservation policy and institutional framework which is necessary to ensure an adequate supply of water in the U.S. for the years to come, clearly, the establishment of uniform national water use efficiency standards for plumbing fixtures is a crucial first step toward that end. Finally, water and wastewater utilities could begin to reverse losses from increased water demand and shortages and start to measure *gains* in water supplies.

With global warming trends, recurrent droughts, and greenhouse effect impacts threatening to further jeopardize the future reliability of our strained water resources, we must begin to act now in the more efficient use of our limited water assets if we expect to ensure both an adequate and sustainable supply of drinking water into the next century. The proposed National Plumbing Products Efficiency Act of 1989 , if passed into law, would do much to ease growing water supply demands and shortages, as well as their corresponding wastewater system burdens. Such a step would help stave off future nationwide water shortage emergencies, as well as the difficult and costly sacrifices they can force us to bear.

In closing, I believe that you have a great opportunity to make one of the most significant contributions to the preservation and conservation of our drinking water resources that this century may ever see. This landmark legislation, if passed, would establish a major milestone in defense of our water resources and a more careful national stewardship of this most precious and vital living resource. I therefore urge your favorable review of this critically important initiative.

Thank you.

Senator BRYAN. Thank you very much, Ms. Vickers.

Mr. Cutler.

## STATEMENT OF DUANE CUTLER, DIRECTOR OF WATER CONSERVATION MARKETING, VOLT ENERGY SYSTEMS

Mr. CUTLER. Good morning, Mr. Chairman.

My name is Duane Cutler and I am with Volt Energy Systems, and I am the Director of Water Conservation Marketing. I would like to take this opportunity to thank you for allowing me the time to address this committee in support of S. 583.

I will read my testimony for the record, but I have written statements from two manufacturers of low-flow plumbing fixtures in support of S. 583 that I would like to have entered into the record.

During the past decade there has been growing interest in water conservation. Many municipalities have seen the cost of new supplies increase markedly as use in their service area has increased beyond the capacity of their wells, aquifers, and reservoirs, forcing them to turn to more distant, more costly sources of water.

Efficient water-conserving devices have become the most cost effective way of reducing residential water consumption. Low-flow showerheads, for example, are inexpensive, easy to install, and provide long-term reductions in use.

As the former Director of Sales and Marketing for Niagara Conservation Corp., the nation's leading manufacturer of low-flow showerheads, I have had direct involvement in the distribution of over 70 million low-flow showerheads, faucet aerators, and toilet devices.

From my perspective, nearly eight years of working within a plumbing manufacturing supply environment, I am here to testify in support of S. 583. I strongly differ with the position of PMI relating to this matter.

It is my position that the bill will benefit U.S. plumbing manufacturers in several different ways. The bill would create federal standards that will restore and maintain a national market for plumbing fixtures. Many states have set inconsistent numeric performance standards, certification and labeling requirements that create confusion for manufacturers and end users alike.

Federal legislation would authorize the involvement of the Customs Service, which will offer more protection against imported products that do not meet applicable standards. Furthermore, by providing additional recourse to the Federal Trade Commission, S. 583 will increase protection to manufacturers and consumers alike against nonconforming products.

In response to PMI's concern that "the proposal will create a federal plumbing czar," the new federal authority proposed by the bill is really quite narrow. It involves test procedures, performance standards and labeling requirements for plumbing products to conserve water.

These authorities must be exercised through public notice and comment procedures that will give all who are interested an opportunity for input. The hundreds of other decisions and specifications that go into the manufacture and distribution and installation of

plumbing products will remain in the hands of non-federal interests, just where they are today.

Responding to PMI's position that "the legislation if enacted will save no additional water": it is obvious that the effect of the bill is to speed the commercialization and market penetration of water efficient plumbing products. Water savings will be substantial.

Some manufacturers are resisting not only federal efforts, but state and local efforts to set tighter standards.

Responding to concerns that "the proposals are woefully inadequate to protect the health and safety of the consumer": there is absolutely no convincing evidence to my knowledge that more efficient products present any significant or insurmountable health or safety issues. All of those agencies and organizations with the responsibilities in these areas can and will continue to review and regulate all plumbing products.

In response to the showerhead performance comparison performed by Delta pertaining to thermal shock and scalding potential, to date I have been unable to find anyone who can follow that comparison, the overall content of that comparison, let alone recreate it.

This particular comparison cries out for further clarification. Factors that I believe have distorted Delta's results include: unrealistically high water pressure, independent pressurization of hot and cold water lines, and the design of the low-flow showerhead used in the test.

Niagara Conservation Corp. has distributed millions of 2.5 GPM low-flow showerheads throughout the United States. To date they have received zero complaints of scalding or thermal shock. Major hardware suppliers have sold thousands of Niagara 2.5 GPM low-flow showerheads to retail customers. There have been no customer complaints.

Thousands of Niagara 2.5 gallon a minute showerheads are used in hotels and motels throughout the United States. They have received no customer complaints to date. This particular market is extremely sensitive to customer complaints.

There are virtually no design constraints associated with low-flow models. Manufacturers can offer a wide range of customer amenities—pulsating, hand-held, and luxury models. In simple terms, manufacturers have nothing to lose and much to gain by the passage of S. 583.

Thank you, Mr. Chairman, for allowing me to express my views. I am ready to respond to any questions you might have.

Senator BRYAN. Mr. Cutler, thank you very much for your testimony.

We have been joined by the ranking member of the subcommittee. I will yield to Senator Gorton for any questions he would like to ask.

I suppose the most important question that I would have, on which I would ask comments from any of the panelists here, is, is it not true that the kind of products and the use of the products which are the subject of this hearing, i.e., products used for residential water use, account for only a tiny percentage of water use in the United States? And, no matter how impressive the statistics

of potential savings are, are they not just simply overwhelmed by the use of water for industrial and agricultural purposes?

Mr. OSANN. I would like to try to respond to that if I may, Mr. Chairman. The answer is yes, the residential—actually, the total municipal and industrial water use in the country is a small fraction of total water use.

Senator GORTON. What fraction?

Mr. OSANN. Less than ten percent.

We are not here to testify that this bill will solve all the nation's water resources problems. There are a wide range of things that need to be done to improve the way we use water across all sectors.

But keep in mind that the municipal water supply is, under virtually all state water allocation laws, the highest priority water use. It is the water supply that has to be maintained to the highest standard of reliability. It is the use around which drought management at its core has to be planned. And in many areas and in many states, it is the use that drives capital investment for water supply.

Ms. VICKERS. I would add to that the important thing to realize is that the drinking water supplies we are talking about affecting, again, are those on the municipal side, our potable drinking water supplies. In a city like Boston, MA or New York City, you probably have about one or two percent of your water supply going toward agricultural use. The rest of the balance of your water supply is for commercial and residential, and that is the area which has such a high percentage of waste in terms of plumbing fixtures—that is the area we are trying to target.

If you are out in the Midwest, in the Farm Belt, clearly residential water use is probably a small fraction of total demand. Obviously these standards will not make quite the dent that they would in a place like Los Angeles or Miami or New York City or Boston.

But the point is, for those of us who depend on water for drinking and for other functional purposes, this bill makes a huge difference because our household water use and commercial water use from plumbing fixtures takes up a large portion of water demand.

Mr. OSANN. Mr. Chairman, I speak for the National Wildlife Federation. We are currently in litigation against the Department of Interior and the Bureau of Reclamation relating to the Bureau's rules for implementing the Recreation Reform Act, in part because we believe the Bureau has failed to carry out the water conservation requirements of the Reclamation Reform Act. And we would welcome the assistance of the plumbing manufacturers, of members of Congress, and of this committee in oversight of the Bureau and the water conservation, water management practices of the federal irrigation assistance program. It is a big area and it needs a considerable amount of attention. But we believe that this bill is a cost effective approach to responding to the problem of municipal water supply and waste water treatment.

Senator GORTON. That leads very naturally to my next question. Each of you, I think each of you, makes reference in his or her testimony to the analogous legislation with respect to appliance energy use, both the disclosure requirements and the substantive requirements of that legislation.

Can you tell me, is this legislation as it is written now a direct parallel to that energy efficiency legislation? Does it cover the same subjects? Does it cover some subjects which the energy legislation does not?

To what degree do they overlap? To what degree do they follow exactly the same philosophy of regulation?

Mr. OSANN. The overall structure of the bill I believe is as close to the appliance energy efficiency program as possible, bearing in mind significant differences between water and energy and plumbing products.

Senator GORTON. For example, it has both mandatory energy standards as well as disclosure requirements.

Mr. OSANN. Yes.

Senator GORTON. Does it have the same kind of regulatory scheme in the Department of Energy as this proposes for the Department of Commerce? That is, the legislation itself sets certain standards, but calls on the Department to continue to review them and to update them and to expand them?

Mr. OSANN. Yes, it does.

Senator GORTON. Anything else? I would really like you to help me with this.

Mr. OSANN. It has a citizen suit provision that is comparable in both bills. It has a provision requiring the participation of the Customs Service that is comparable in both bills.

It has procedures involving the Federal Trade Commission that are comparable in both bills. It is really based as closely as possible on the appliance energy efficiency program, which we of course know was widely supported in the Congress and we believe is working reasonably well in practice.

Mr. BERLE. One other point to add with respect to that is that this legislation requires that the Department of Energy deal with the situation of household dishwashers and other appliances, where they are currently in the process of putting in standards with respect to energy efficiency.

So this bill takes that appliance and puts both the water and the energy piece in one place.

Senator GORTON. Is it your testimony that points out it is going to be ten years before they can actually implement that?

Mr. BERLE. That is correct. If we had a criticism, it would be that that process in DOE should be accelerated, because as we see the rulemaking process, it would be 1998 before they finally brought all of the issues to closure.

Senator GORTON. Is there anything in this bill or in any of your suggestions as to how we pay for whatever that division that we create in the Department of Commerce to enforce this?

Mr. OSANN. If I could respond to that, Mr. Chairman. We believe that the federal government as a water and energy user will save more than it costs to administer this program. The legislation authorizes ranging from $1 to $2 million per year.

It is a very narrowly drawn, very small regulatory effort, and we believe the federal savings with, I believe, the current level of armed forces of about 1.3 million people and the federal civilian work force of over 2 million people, the federal government is going to save money as a consumer that will more than offset those costs.

Senator GORTON. You point out that this obviously will save the households money as they use less water. How much increase in the capital cost of building a new home or remodeling a new home would be involved in the remodeling and the redesign of so many kinds of appliances?

Ms. VICKERS. There is no additional cost. If anything, there is a savings. The water efficient plumbing fixtures which we have out can be easily accommodated to any existing plumbing system you would find.

Long-term, I think what the building industry can do and benefit by is downsize plumbing systems, both in the home and in the water and waste water distribution system, because we will have reduced flows as more and more efficient fixtures are installed and put to use.

One thing I wanted to say about the industry, if there is any industry out there which is underregulated it is the plumbingware industry. We currently have the situation where many state plumbing codes regulate water use, but there are many quirks and variations in those state codes.

That's why the industry is better off with a uniform standard, instead of having to run around state by state to have a code that is amenable to them. I am skeptical when certain industry representatives say that they would like to only have local or state codes. If that is true, why are they fighting on the local level to not have water efficient codes or standards in place? Such opposition has occurred every state where we have now passed water efficient fixtures legislation.

Senator GORTON. Do we have any indication of consumer response in those areas in which there is a consumer opportunity to buy these more efficient appliances or fixtures or standard ones? What do consumers choose when they are aware of that choice?

Ms. VICKERS. It has been overwhelmingly positive. I think Massachusetts is probably the best example right now, because we have had the standard for the longest amount of time, and metropolitan Boston does have a very active water conservation program, so people are aware of it.

There is a tremendous amount of retrofitting going on, where homes or subdivisions or commercial institutional entities are replacing their old fixtures with water efficient fixtures to save water and money. This is happening very quickly, not just in Massachusetts. It's going on all around the country. I was down in Florida and Atlanta last week talking with some utilities who were trying to do this voluntarily, again because this water represents an additional hidden supply that they can capture very, very inexpensively by installing low flow fixtures.

I would also mention on the consumer side, that people want to save water. Many are aware of the problems that we are having, but they are not easily educated about how much water they are using, or how they can easily save water.

One of the important components of the bill is the labeling requirement, and I have designed what is really a prototype——

Senator GORTON. I noted that in your testimony.

Ms. VICKERS [continuing]. Water use guide label, which is very much like the energy label we have through the energy legislation.

It tells people how much water you are using if you buy this fixture and how much it is costing you. Again, I think people want to see the savings. And from my experience in the public sector and dealing with the public and private institutions, people are thrilled to know they are saving water and helping to reduce associated costs.

Senator GORTON. Thank you, Mr. Chairman.

Senator BRYAN. Thank you very much, Senator Gorton.

You do not have to persuade somebody from Nevada as to the importance of conserving water. But it seems to me that you do carry the burden of proof on why we should preempt a local or state standard and, in effect, establish a federal standard.

I would like to ask first, how many states have established a standard, and is that standard centered around the 1.6 that you are advocating in the bill?

Ms. VICKERS. We now have, I believe, seven or eight. They are New York, Connecticut, Rhode Island, Washington, Massachusetts, California, New Jersey, Delaware, and Pennsylvania who have done this, and this has all been within the last year that this has occurred.

Senator BRYAN. And do each of the states that you have cited adopt the 1.6 standard?

Ms. VICKERS. Yes, they do, each and every one of them.

Senator BRYAN. Without being too tough on you in terms of the math, what percentage of the total population does that represent? I know California is 28 million people, but I am not as familiar with the population of the other states.

Mr. OSANN. I think we are probably talking about 40 percent.

Senator BRYAN. I am sorry?

Mr. OSANN. Probably 40 percent.

Senator BRYAN. About 40 percent?

Mr. OSANN. Or 45 percent.

Senator BRYAN. If the legislation in each of those states in effect tracks the standard and you have got 40 percent of the people in the entire country and this has just occurred in the last year, I suppose by implication you are suggesting that there is momentum building, that the very persuasive case that you have made for water conservation this morning has also fallen upon receptive ears at the state and local level.

Will not, if one plays the devil's advocate for a moment, will not that in effect drive the manufacturing process? If today it is 40 percent and assuming you continue to develop this kind of momentum and next year it is 50 percent and the year thereafter it is 60 percent, in effect does that not create the standard?

Ms. VICKERS. What we have are two standards. For instance, on the toilets we have the 3.5 gallons per flush standard which has been in place for about ten years. Now we are able to have the 1.6.

The problem is the manufacturers. The manufacturers are happy to supply both fixtures, because there has been some question about performance of the 1.6. Hence, they are playing on the fears of the public in this regard by offering both products and letting the consumers decide which they want.

I think it is going to end up costing the industry more money to have two standards. That means two trucks with different size fixtures when they only need one.

Again, these are hidden savings. In changing these standards, one of the best things about it is that people do not notice any change or reduction in the function or performance of these fixtures. They are automatic, painless, non-sacrificial savings they can get to reduce their water demand.

Mr. OSANN. Mr. Chairman, I think it is worth pointing out that there are important gaps in the state and local regulatory effort, that we think the federal standard that applies at the point of manufacture can deal with most efficiently. Most states and localities establish—where they do have standards for these products—they are established through their building and plumbing code.

That presents several gaps. First of all, not all jurisdictions, not all states, have a plumbing code. Not all local jurisdictions have a plumbing code. It is a small minority of jurisdictions, but there are some important areas experiencing growth that have no codes.

Second, codes do not apply to all installations. They apply to permitted construction. So a good deal of the renovation and replacement activity in the country does not require a building permit, does not require a plumbing permit, and is not subject to the code requirements.

You have direct retail sales to consumers that are not subject to the code requirements. You can go to—in this area, you can go to Hechinger's department store—and buy a showerhead and take it home, put it in, install it yourself. You do not need a plumber to do that and you certainly do not need a building or plumbing permit for that.

So those are gaps in what is the predominant regulatory format at the state and local level, and those are gaps by which nonconforming products are on the market, they are installed, and they are wasting water for decades as a result of it.

Senator BRYAN. Mr. Berle, you looked like you wanted to respond.

Mr. BERLE. I think he said it all.

Senator BRYAN. All right.

The industry I am sure is going to testify in a few moments that, look, we are working at a standard, we are nearly finished, give us a chance to do it. Why should we not allow them that opportunity? I hope you will speak candidly to the subcommittee—do you think that they are just trying to pacify us, they are not going to do it, that the standard that they are going to come up with is unlikely to be realistic?

Why not give them that opportunity before the federal government intervenes? And I will toss that to any one of you.

Ms. VICKERS. I think the point is again that they have already taken the opportunity. I have been impressed that within the last two years we have gone from having three manufacturers who can produce a 1.6 to more than 15 now. The major manufacturers are there with the products to deliver.

There are products out there that are working very well. I do not see any reason for delay.

As I was saying earlier, I think that——

Senator BRYAN. Well, but Ms. Vickers, if I could. I do not mean to be rude and I want you to be able to fully respond. But the federal government oftentimes is importuned to get involved in an area and, frankly, we sometimes do so very clumsily.

My question is a policy matter. I am not trying to make a prejudgment because I have not. But I think that some would say, look, that is a massive intervention by the federal government in what has traditionally been state and local areas of concern.

Mr. Osann and others have made arguments as to why that is a balkanization, to use Mr. Berle's terminology. But if the industry is about ready to come together on a voluntary standard, why should we not give them that opportunity? Maybe you think that they are just stalling us and not going to do anything.

Ms. VICKERS. I would say that is my answer. And again, I want to go back to what I believe is a market issue. I think for many years there were just a few industry leaders in this field who produced 1.6 gpf water closets, and what happened when Massachusetts began requiring the 1.6, well, the major plumbingware manufacturers did not have a product to meet that demand.

They got very nervous when they saw these smaller manufacturers with excellent working products rushing right into the state, taking over their market lead. Clearly, these major manufacturers are putting out products now, but I think they are concerned that they are losing their market share and they want to maintain their dominance and push out the smaller manufacturers who are moving in.

I think what they would like to see is this thing stall for a year. But the legislation is not an industry or market issue—it is a water conservation issue. I do not think the environment can wait. I do not think the taxpayers can afford the costs of continuing to waste water down their toilets.

It is a hideous statement about our attitudes toward this great resource that we are willing to throw out potable drinking water down the toilet and contaminate it. This is a terrible waste of our water resources. I can find no reason to continue that path.

Mr. BERLE. Mr. Chairman.

Senator BRYAN. Mr. Berle.

Mr. BERLE. Just to add to that, obviously there are more interests involved here than simply the manufacturers.

Senator BRYAN. Sure.

Mr. BERLE. And I would suggest that the adoption of federal standards deals with the larger issue in terms of water use. It also provides a degree of consumer protection through the labeling and standard-setting process which does not occur if you have a process going on individually with each manufacturer and each state.

And I think those are interests that are at least as important as the manufacturers themselves.

Senator BRYAN. Assuming for the sake of argument that this legislation were enacted, are you satisfied that, in the time frames prescribed in the bill, the demand for the product could be met by the industry?

Ms. VICKERS. As I said, the manufacturers are already out there producing the products. I think we have 1991 for the showerheads, faucets, aerators, and the urinals. Again, the fixtures are there.

The toilets, 1992. I think generally those are very acceptable deadlines.

It does not cost a terrible amount to the manufacturers to switch over to these different sizes. The manufacturers regularly change the design of their fixtures, oftentimes for aesthetic purposes. It does not cost them any more to make new molds.

Like I said, the fixtures are there and I am seeing the products on the shelves.

Mr. OSANN. Mr. Chairman, if I understood your question, there are a couple of themes I think you are trying to develop here for the record. One relates to timeliness: Do the manufacturers need more time? And secondly, is federal involvement or, to put a pejorative spin on it, federal intrusion really warranted?

As far as the timing goes, I would say yes, the manufacturers need more time. That is why the bill is drawn to provide a 1992 standard instead of upon date of enactment. Of course there is a need for transition. There will be a transition, and there is a need to allow time to do that, not only for the manufacturers, but to allow all the chain of interests—the wholesalers, the trades people that are involved in installing these products, and the contractors—to become more familiar with them, to understand their use.

So that is why the deadlines in the bill are not immediate.

There are a variety of products that constitute the available universe of water closets in this country. About 70 percent of those are the most familiar two-piece tank-type toilets, and virtually every major and most minor U.S. manufacturer now has a two-piece tank-type toilet on the market, which makes up 70 percent of total sales.

So I think there is no question but that the industry is prepared to respond to a 1992 standard for the most widely used product in the market. We would encourage the committee to take—to probe this question further—and to take careful note of industry responses regarding other products that have more limited production runs, and whether those products are available or whether there is in fact a material need to have additional time to adjust production lines.

The second part of your question I think related to federal intrusion. There is going to be a character that is sort of hovering around this room, an imaginary character, Mr. Chairman. He has been given a title already, even though he does not exist, and he is called "the federal plumbing czar."

This is a construct of opponents of the bill. The bill does not authorize a czar. The regulatory program that is authorized in this bill is very narrowly drawn. It relates to the performance of plumbing products with respect to their water use.

It does not affect hundreds of other decisions that go into the design and the installation of these products. We do not want a federal plumbing czar. I cannot imagine how that would work, if you gave a federal official control over all of these kinds of decisions.

I mean, colors. Can you imagine some federal official deciding what were acceptable colors? I think we would get all battleship grey and khaki plumbing products coming out of that kind of a process. That is not what this bill does. It focuses very narrowly on the conservation performance of these products.

And as far as the industry coming along and progress more or less being inevitable, I think it is again important to note that the consensus building process is not designed to maximize conservation savings consistent with economic feasibility, and that is the way the standard-setting requirement is in the energy appliance program and that is the core of the standard-setting process that we are proposing here for plumbing products.

Senator BRYAN. One last question of the panel, and that is 1.6. I noticed that in I believe your testimony, Mr. Berle, that dealt with Phoenix or one of the municipalities in Arizona, there appeared to be a higher standard, I think a 1.5.

And I guess my question is, is 1.6 a standard which is pretty much universally recognized by the advocates, recognizing that the industry is going to offer some different testimony?

I am not suggesting there is a unanimity of opinion throughout America, but by and large, among the advocates for change, is 1.6 the standard or do we have others who feel 1.6 is too little or too much?

Mr. BERLE. I think there is fairly broad acceptance of the 1.6 number.

Ms. VICKERS. Also, the way we got the 1.6 is the European metric equivalent to six liters, and that is the standard we have had for years.

Senator BRYAN. Senator Gorton.

Senator GORTON. Why should Phoenix not be able to have 1.5 if it wishes to do so in the middle of a desert?

Ms. VICKERS. It can. There are some fixtures which test out at 1.5, but many of them test out at 1.523.

Senator GORTON. Well, are you not preempting that standard in this bill?

Ms. VICKERS. No, because all we are saying is the maximum standard is 1.6. S. 583 would preempt State and locals.

Senator BRYAN. That is Senator Gorton's question.

Mr. BERLE. But this bill also has provisions by which special circumstances can be exempted.

Senator GORTON. Why should not Phoenix be able to have 1.5 without having to come to an official at the Department of Commerce, whether he is a czar or not?

Mr. OSANN. That is a decision for the committee. The rationale for it in the bill is to restore and maintain a national market in plumbing products. That is presumably of interest to the plumbing industry.

I think all the people here at this table, perhaps with the exception of the manufacturers' testimony from Mr. Cutler, would be open to variations on that preemption issue. But I do not know where that leaves you in terms of building a consensus towards the bill from the perspective of the manufacturers.

Senator GORTON. Thank you, Mr. Chairman.

Senator BRYAN. Thank you very much.

I would like to express on behalf of the subcommittee our appreciation for your very thoughtful testimony and for your candid responses to the questions that the subcommittee had. We appreciate that.

Our next panel will consist of: Mr. George Bliss, the Director of Training, the United Association of Journeymen and Apprentices of the Plumbing and Pipefitting Industry of the United States and Canada; Mr. Craig Selover, the Delta Faucet Company, on behalf of the Plumbing Manufacturers Institute; Mr. Robert M. Gants, Vice President, Government Relations, Association of Home Appliance Manufacturers; and Mr. Patrick J. Higgins, President of PJ Higgins and Associates, Inc.

Gentlemen, welcome to the panel. We will begin with Mr. Bliss and ask you, as we did the previous panel, that if your prepared testimony is longer than the five minutes, it will be incorporated in the record. We would please ask you to try to hew to that five-minute line.

Mr. Bliss.

**STATEMENT OF GEORGE BLISS, ASSISTANT DIRECTOR OF TRAINING, UNITED ASSOCIATION OF PLUMBERS AND PIPEFITTERS, ACCOMPANIED BY FRANK FINKEL, AMERICAN SUPPLY ASSOCIATION**

Mr. BLISS. Thank you, Mr. Chairman. I assume that the written testimony we provided will be included as well?

Senator BRYAN. It will indeed.

Mr. BLISS. Thank you, sir.

Mr. Chairman, my name is George Bliss. I am the Assistant Director of Training for the United Association of Plumbers and Pipefitters of the AFL-CIO. I am also a board member of the American Society of Sanitary Engineering and a member of the A40 plumbing code committee of the American National Standards Institute, appearing here today on behalf of the Ad Hoc Committee on Water Conservation.

The Ad Hoc Committee was assembled specifically to address the subject of legislation at hand and, in addition to the union and the sanitary engineers, consists of the National Association of Plumbing, Heating, Cooling Contractors, the American Supply Association, the Mechanical Contractors of America.

I am accompanied by Mr. Frank Finkel, a member of the ASA.

Let me say at the outset that we recognize and applaud the efforts of the sponsor of this legislation. Conservation of the nation's water resources is a laudible and necessary objective that should be shared by all Americans.

But conservation efforts will ultimately fail if proper regard is not given to reasonable public demand for sound performance standards in water supply and waste disposal. Furthermore, because it is critical to the success of conservation, we believe much more needs to be done to determine whether the public is prepared to accept such sweeping changes in a technology that is so much a part of everyday life.

There are two major points that the Ad Hoc Committee feels need to be made about this legislation. The first is that more research must be conducted to determine the effect of reduced flow on plumbing systems which were designed for a larger volume flush before we can know the full potential effect of the nationwide low-flow standard.

Second, the plumbing industry is already responding to the nation's water crisis through a system of model codes and consensus performance standards.

On the first point, a water closet is a part of an integrated plumbing system in which the size, angle, and length of the pipes is coordinated with the amount of water in one flush to ensure that the waste is adequately removed. When the amount of water is cut by more than half, there is reason to doubt whether the system will operate properly.

Evidence on this issue is limited and conflicting. Studies demonstrating that the technology works have been narrow studies with specific test product or which have been conducted under ideal laboratory conditions simulating the most modern plumbing systems.

We need to compare currently available water closets to see which work effectively. We need to know if branch drain sizing in major plumbing codes needs to be changed and how low-flow toilets will work with older plumbing systems designed for a larger volume flush.

We do not really know how they will affect drainage, waste and vent systems, pipe grading, or even the extent to which bowl staining will become a factor.

I am aware of the published study of the ultra-low-flush in a subdivision in Glendale, Arizona, where performance was measured against a neighboring subdivision with standard flow toilets. It has been used to suggest that low-flow toilets can save water without significantly reducing efficiency and without causing damage downstream.

Even if we agree that the Arizona study was reliable—and there is some question about that—I believe that we cannot simply extend the results there to include that it would have the same effect that could be attained in New York, Chicago, Los Angeles, Cleveland, or all the other major areas.

Plumbing systems in most American cities are much older and more complex than in Glendale, Arizona. If we mandate the ultra-low-flow fixtures on such communities before adequate study of the impact downstream and on public acceptance, we would be courting enormously costly retrofitting and renovation, as well as system failure.

To answer these and other questions, the National Association of Plumbing, Heating, Cooling Contractors Educational Foundation, in conjunction with the American Society of Plumbing Engineers Research Foundation, is working with an independent laboratory to conduct research. NAPHCC and ASPE have already funded a project and are working up a specific agreement with the particular institution.

Without adequate research, S. 583 would jeopardize a plumbing system which meets the needs of society so well that its high performance has become a given to the society. At the same time, S. 583 would virtually wrest control of the plumbing industry away from a combination of private market and local regulation and turn it over to the federal government.

The industry, operating through its own code system, has given us the world's most sanitary, effective plumbing system, one which is responsive in the areas of water conservation. Why then is it

necessary to give the Secretary of Commerce discretionary powers over the plumbing industry?

This will create a new bureaucracy of people who know little about the plumbing industry and give it considerable authority over those of us who have devoted many years of study and practical experience to the field.

Also, this proposal does not take into account the personal habits of consumers or the relatively small amount of water consumed by the plumbing system—only seven percent, according to a recent Library of Congress report.

We understand why it is so tempting to propose this legislation. At first glance it appears to be a way to save at least some water by a stroke of a legislative pen. But we submit the first glance is not enough.

We believe there is a tradeoff here that is dubious at best and potentially harmful to consumers and even to water conservation itself. I understand there is another bill in the Senate calling for a comprehensive analysis of the nation's water resources to ascertain where water savings can best be achieved. We believe that it is a wiser approach than the shot in the dark approach of S. 583.

There is a long-running cliche often heard in the halls of Congress: Don't throw out the baby with the bathwater. Where S. 583 is concerned, that phrase has real meaning at last.

I would like to thank Chairman Bryan for giving us the time to address this distinguished panel on this subject and would be happy to answer any questions.

[The statement follows:]

STATEMENT OF GEORGE BLISS, ASSISTANT DIRECTOR OF TRAINING, UNITED ASSOCIATION OF PLUMBERS AND PIPEFITTERS, ON BEHALF OF THE AD HOC COMMITTEE ON WATER CONSERVATION

Mr. Chairman, my name is George Bliss. I am Assistant Director of Training for the United Association of Plumbers and Pipefitters. I am also a Board member of the American Society of Sanitary Engineers and a member of the A-40 plumbing code committee of the American National Standards Institute appearing here today on behalf of the Ad Hoc Committee on Water Conservation. The Ad Hoc Committee was assembled specifically to address the subject of the legislation at hand, and in addition to the union and the Sanitary Engineers, consists of the National Association of Plumbing-Heating-Cooling Contractors, the American Supply Association, and the Mechanical Contractors of America.

I would like to take the next few minutes to address S.583, the National Plumbing Products Efficiency Act. Let me say at the outset that we recognize and applaud the efforts of Senator Fowler and the co-sponsors of the legislation. Conservation of the Nation's water resources is a laudable and necessary objective that should be shared by all Americans. But conservation efforts will ultimately fail if proper regard is not given to the reasonable public demand for sound performance standards in water supply and waste disposal. Furthermore, because it is critical to success in conservation, we believe much more needs to be done to determine whether the public is prepared to accept such sweeping changes in a technology that is so much a part of everyday life.

There are two major points that the Ad Hoc Committee feels needs to be made about this legislation. The first is that more

research needs to be conducted, to determine the effect of reduced flow on plumbing systems which were designed for a larger volume flush, before we can know the full potential effect of a nationwide low flow standard. Secondly, the plumbing industry is already responding to the nation's water crisis through the system of model codes and consensus performance standards.

On the first point, a water closet is part of an integrated plumbing system, in which the size, angle, and length of the pipes is coordinated with the amount of water in one flush to ensure that waste is adequately removed. When the amount of water is cut by more than half, there is reason to doubt whether the system will operate properly. Hard evidence on this issue is limited and conflicting. Studies demonstrating that the technology works have been narrow studies which test a specific product, or which have been conducted under ideal laboratory conditions simulating the most modern plumbing systems.

The oft-cited "Phoenix study", for example, was conducted on two relatively new subdivisions in the suburb of Glendale. Its conclusions were based on a total of 128 responses. It gauged the performance of one type of ULF imported toilet whose Swedish maker, Ifo Sanitaire, partially funded the study.

Broader, more comprehensive research, conducted by an independent facility, is necessary before Congress even considers setting a national standard requiring the use of ULF fixtures. Specifically, the following questions need to be addressed: 1) which of currently available water closets effectively flush

solids an adequate distance to avoid buildup?; 2) should branch drain sizing required by model national plumbing codes be increased, reduced, or stay the same and how will ULV toilets work with older drainage systems designed for larger-capacity fixtures?; 3) how will ULV water closets affect aging Drainage Waste and Vent (DWV) systems?; 4) should vent sizing required by major national codes be increased, reduced, or stay the same?; 5) to what extent will bowl staining become a factor due to low flush?; and 6) what will the effect of low flush be on pipe grading?

A recently completed report by the Congressional Research Service concurs that further research is necessary before proceeding with mandatory federal legislation.

> Research and Study. "A number of topics merit further study in connection with developing water conservation policies. Prominent among the issues are technical questions about performance of low-water-use plumbing fixtures, including so-called drain line carry and impact on hydraulics of waste water collection systems. Evaluation of these questions calls for the combined resources of industry, States and regions, and the Federal Government. At the Federal level, the National Institute of Standards and Technology could develop a test protocol or other research design to assess these kinds of questions in multiple settings, including communities of different size and age of infrastructure."

To answer these and other questions, the National Association of Plumbing-Heating-Cooling Contractors Educational Foundation, in conjunction with the American Society of Plumbing Engineers Research Foundation, is working with an independent laboratory to conduct some of the necessary research. NAPHCC and ASPE have already funded the project and are working up a specific agreement with a particular institution.

It is not our purpose to oppose the development of ULF technology. Many expect to see it widely used in the future. In the meantime, however, there is evidence to indicate that, in its current stage of development, ULF technology may cause problems under certain conditions. Consider, for example, the case with Mount Ida College, in Newton Center, Massachusetts (attachment A). The school had ULV toilets installed in a new dormitory, and immediately began to experience problems. There were stoppages throughout the building, and widespread dissatisfaction among the students using them. They were so problematic that after several weeks, the 1.6 gpf toilets were removed and 3 gpf fixtures installed.

This brings us to the system of model plumbing codes, which are designed to protect the public and through which the industry has been responding to the water shortage to make the system more efficient.

The plumbing industry chain of operation goes from manufacturers, to suppliers, to contractors, and on to the consumer. Engineers provide the technical design for the job,

and, of course, the union represents labor. Since every one of these groups are affected by plumbing code changes, all have cause for concern and all have considerable input into the process. ANSI is the primary organization which develops consensus standards for specific products, while Plumbing Codes set performance requirements, which are designed to protect the health of the public. They specify, for example, what pipe size is required to remove a certain amount of sewage and supply potable water, how sewer gases are to be adequately vented, and how piping is designed and installed so the system can be effectively maintained for maximum health protection.

There are several model national plumbing codes, among them National Standard, Building Officials and Code Administrators, Southern, and finally, the International Association of Plumbing and Mechanical Officials, which is the body that develops uniform plumbing codes. A plumbing code becomes binding when it is adopted as statute by a city, county or state. State or local governments sometimes adopt a customized code which is based on one of the major codes, and most areas of the country are covered by some form of plumbing code.

In the interest of water conservation, the four major codes now require the 3.5 gallon per flush (gpf) "water saver" toilet, which has been the standard in most parts of the country for about ten years. The standard prior to this was 5-7 gpf. Also, a code change request has been submitted to the NSPC Committee to require 1.6 gpf water closets in new construction and

replacements. Likewise, the American National Standards Institute (ANSI) Committee A112 is revising current performance requirements in the national standard to include 1.6 gpf water closets. As you can see, the ULF issue is already under serious discussion within the industry.

There are several other aspects of this legislation that need to be addressed. The industry, operating through its own code system, has given us the world's most sanitary, effective plumbing system -- one which is responsive to water conservation needs and health concerns. Why then, is it necessary to give the Secretary of Commerce discretionary powers over the plumbing industry? This will create a new bureaucracy of people who know little about the plumbing industry, and give it considerable authority over those of us who have devoted many years of study and practical experience to this field.

It should also be pointed out that domestic plumbing systems consume relatively small amounts of water. According to a CRS report entitled "Water Conservation: Options for the Residential Sector", water for domestic purposes accounts for 7 percent of fresh water withdrawals in the United States. Landscape irrigation, or lawn watering, accounts for 46 percent of water used for residential purposes. Estimates of the amount of water to be saved by S.583 may fail to take into account the fact that, since it applies only to new construction and replacements, it would be many years before full savings could be realized. I fail to understand why the nation's plumbing system, which uses

relatively little water, should be singled out for conservation when most of the water used is in the agricultural sector. Any legislation to address water conservation should look at all the significant areas of water use to explore appropriate methods for achieving water conservation. The Ad Hoc Committee on Water Conservation favors an approach such as that taken by Senator Fowler's other water conservation proposal, the "Municipal and Industrial Water Conservation Act". This proposal seems to us like a much more realistic and effective approach to the nation's water crisis.

And, finally, S.583 fails to take the personal habits of the consumer into account. People are likely to water their lawns longer and take longer showers. Obviously, when it comes to filling a bathtub, a ULF fixture is a mere aggravation which won't save any water at all. A survey by NAPHCC of its membership earlier this year indicates that nearly half of the contractors who have experience with ULF toilets report that it takes two or more flushes to clear the bowl. Obviously, this will negate any supposed savings.

In conclusion, I would like to thank Chairman Bryan for giving me the time to address this distinguished panel on this subject.

Senator BRYAN. Thank you very much, Mr. Bliss.
Mr. Selover.

## STATEMENT OF CRAIG SELOVER, DELTA FAUCET CO., ON BEHALF OF THE PLUMBING MANUFACTURERS INSTITUTE

Mr. SELOVER. Thank you, Mr. Chairman.

I am Craig Selover, Vice President of Engineering for the Delta Faucet Company. I am also a vice chairman of the Plumbing Manufacturers Institute, the PMI, which is a trade organization whose membership accounts for a majority of domestic production of plumbing fixtures and fittings.

I also serve on the ANSI A112 committee on the standardization of plumbing materials, and I am chairman of its Panel 18 subcommittee on standardization for faucets and showerheads and fittings.

The PMI opposes the National Plumbing Products Efficiency Act of 1989 as legislation which is wholly unnecessary due to the existing process of ANSI standards and codes promulgation. It would create a needless federal bureaucracy and waste taxpayers' money.

Last year's drought created severe conditions across the nation. It focused attention on the critical role the federal government, state and municipal governments, and the industry must take in sharing future water conservation initiatives. We believe that the federal government can be most effective by providing leadership in the following areas:

One, funding or cooperating in research to develop statistical and demographically valid home water use data, which do not exist today;

Two, to cooperate and help in validating state of the art water conservation technologies;

Three, to support public awareness programs aimed at changing wasteful water use habits;

And four, the development and support of a comprehensive national water policy that addresses all aspects of this critical public policy issue.

The plumbing supply and drainage systems in the United States are the best in the world. They are the envy of many countries through their demonstrated ability to protect the health and safety and satisfy the high standards that the American public has come to expect from their plumbing system.

The changes to this system operate through national consensus standards, which are then integrated into the plumbing codes, plumbing codes being the way our industry is regulated.

One of the things that has concerned me about previous comments is that the consensus process involves the participation of manufacturers, certainly, but also regulators, designers, installers and users.

On my Panel 18 on faucets and fittings, 25 percent of the committee are regulators who have represented water or energy conservation groups, that being their primary interest in participating.

I am very much disappointed to hear that there are complaints about the standards process because we have heard nothing before the introduction of the earlier draft of this bill and Congressman Atkins' bill last year. No one had approached Panel 18 to even talk

about changing any of the flow rates for faucets, fittings, and showerheads.

We certainly welcome their input. Some of those members are actually part of our committee.

The process after standards are developed—and we certainly have an option any time the standards are revised, which happens on a regular basis, at least every five years—is to get input either from members in the regulatory area who are taking part directly in our standards process on the committees or through their participation in reviewing the standard, to comment on deficiencies in the standards where they do not address water conservation or other issues of performance.

The problem is that these people have not participated in the process. But the process is wide open for them to come and participate, and we would welcome it.

We are not against water conservation, but there are many aspects of water conservation which cause us to carefully evaluate their effects on the overall plumbing systems as they relate to the codes.

Once a standard has been through the consensus process and is approved or revised and approved, it is then referenced in model plumbing codes. There are several throughout the country. They all reference the ANSI standards for product performance. And as a standard is revised, the codes go through a routine adoption of the latest revision of the standard.

And that is how we end up to be regulated, and what is a voluntary and consensus standard has the force of law then as those model codes are used by virtually all of the local or state jurisdictions in the United States to enforce the plumbing product performance.

The process is there. Both my committee on faucets and fittings and showerheads and Panel 19, which deals with fixtures, are currently working on standards and have task groups to try and work on and make recommendations for language change to further take into account water reduction and water conservation.

I think in summary let me emphasize that the plumbing industry has led the way in supporting water conservation through plumbing systems and strongly supports continued regulation through the existing structure of the American National Standards and plumbing codes.

However, we would still welcome the support of the federal government and its agencies in this process, but not through setting arbitrary and unnecessary standards and by spending taxpayers' money on needless bureaucracies, but by participating with us through the existing process.

Thank you, Mr. Chairman. When we get to the question and answer period, since my expertise is primarily in showerheads and faucets, we have arranged for Mr. John Genovese, who is the Vice President for Engineering of the American Standard Company, to help in answering questions on fixtures.

[The statement follows:]

Supplementary Statement

by

The Plumbing Manufacturers Institute

## A. SHOWER HEAD FLOW RATES

Introduction:

Based on a careful review of the testimony presented by proponents at the October 4, 1989 hearing on the National Plumbing Products Efficiency Act of 1989 before the Senate Commerce Committee's Consumer Subcommittee, there appears to be significant misunderstanding of shower head flow rates and their role in water conservation.

It should first be noted that lowering maximum shower head flow rates to conserve water has been promoted by the industry since the mid 1970s. Industry is no stranger to positive actions on environmental concerns. (Please see the additional Plumbing Manufacturers Institute submittal on industry's history of involvement in water conservation).

American National Standards Test Procedures:

The initial misunderstanding relates to shower head flow rates within American National Standard A112.18.1, Finished and Rough Plumbing Fixture Fittings. This standard, upon which plumbing code requirements are based, requires shower heads to flow at a maximum of 3.0 gallons per minute (gpm) at a water pressure of 80 pounds per square inch gauge (psig). In the test procedure a shower head is attached directly to a pipe through which water is flowing at 80 psig. The rate of flow from the shower head must not exceed 3.0 gpm under these test conditions. It has become common practice for proponents of water conservation to equate 3.0 gpm with actual shower head flow rates when, in fact, this test is more of a quality control test than a test designed to represent "real world" user conditions.

The reality is that virtually no shower heads manufactured today flow at 3.0 gpm. There are important reasons why shower head flow rates do not reach the maximum allowable flow rate:

1.) Manufacturers must design their products somewhat below the maximum flow rate to account for the piece to piece variation inherent in any manufacturing process. Consequently, the typical design flow rate is no greater than 2.6-2.8 gpm maximum, not 3.0 gpm.
2.) Very few installations have a flowing pressure of 80 psig at the shower head. There are two important reasons:
    a.) Virtually all plumbing codes require the installation of a pressure reducing valve (PRV) if water

pressure from the water main exceeds 80 psi. Pressure loss in the building's interior plumbing will naturally decrease the pressure even further before it reaches the shower head.

b.) Water main pressures are typically not as high as 80 psi.

How Much Water Do Shower Heads Deliver in the Real World?

The primary variable associated with the answer to this question is water pressure. We have attempted to provide an answer to the fundamental question: "How much water is being used in the shower?" Of necessity, certain assumptions must be made. We have used as much credible data as are available to validate the assumptions.

Assumption: Typical water main pressure for residential applications is 50 pounds per square inch (psi), not 80 psi. See Appendix A for a discussion of how this assumption was reached.

Assumption: Shower head flow rate data from a sampling of manufacturers is typical and can be generalized to all shower heads, and can be averaged. See Appendix B for a discussion of this assumption.

Assumption: Consumers/users will use shower heads at full flow, i.e. they will open the shower valve full when showering (See Appendix C for information on a U.S. Department of Housing and Urban Development study on these issues).

We have chosen 50 psi as our typical water pressure at the street water main. Tests of actual flow rates of existing shower heads at various water pressures show that at 50 psig the average of the heads delivers 2.45 gallons per minute flow (gpm). Estimates of water savings by proponents of federal regulation are based on the difference between 3.0 gpm and 2.5 gpm. The industry is already providing products which meet the standards contemplated in the Atkins-Fowler bills.

But, 2.45 gpm is still too high in the "real world." Water pressure drops between the water main and the shower head. If water main pressure is 50 psi, shower heads in a home will be operating on a range of actual pressure at the shower head of 25-35 psi. In our shower head flow rate tests the average flow at 20 psig is 1.62 gpm. At 30 psig the average flow rate is 1.95 gpm.

It is important to point out the design function which is necessary for all plumbing systems. The plumbing engineer designs plumbing systems for buildings. This design considers the demand for water use which is expected. Based on

water demand of the fixtures in the home plumbing system, the engineer must provide sufficient water (and waste water removal) to meet peak demand loads. Generally, this may mean that between 6-8:00 a.m. on a weekday, sufficient hot and cold water may have to be available in a home for showering, flushing toilets, running the dishwasher, starting a load of laundry, cooking, and sprinkling the lawn in the summertime. Many other families on the water main zone will be using water in a similar way, thus lowering available water pressure.

The plumbing engineer starts his task with one fundamental known factor: water main pressure. He will then be given by the contractor or builder the number of bathrooms and other types of water outlets in the building. He can then design the layout and size the piping system. All these factors are controlled not only by engineering principles but also by the plumbing code.

What happens to the 50 psi in the water main? The water for your morning shower runs through a system of pipes and valves (as well as a hot water heater and maybe a water softener) before it gets to the shower head. According to references in the National Plumbing Code (published by the Building Officials and Code Administrators International) and the Standard Plumbing Code (published by the Southern Building Code Congress International), these are the considerations which must be taken into account in sizing water piping:

a.) The pressure required at the fixture to produce adequate flow (normally 8 psig for residential fixtures).
b.) Static pressure loss (0.43 psi for each foot of pipe rise).
c.) Pressure loss through a water meter.
d.) Pressure loss through the tap in the water main.
e.) Pressure loss through special devices such as filters, water softeners, etc.
f.) Pressure loss through other control valves and fittings.
g.) Pressure loss due to pipe friction.

Making allowance for normal, but conservative, pressure losses between the water main and the shower head, we compute the following losses:

| | |
|---|---|
| a.) Water main tap - | 0.64 psi |
| b.) Water meter - | 1.00 psi |
| c.) 12 fittings and valves - | .24 psi |
| d.) 110 feet of piping - | 2.20 psi |
| e.) Static loss (height from main to a first floor shower valve (10') | 4.3 psi |
| TOTAL | 8.38 psi |

This is the best case. We are not making allowance for water softeners or for a second floor bath. A second story shower would have an additional pressure loss of 0.43 times 8 feet, or 3.44 psi. So, we will assume a 9 psi pressure loss between the water main pressure of 50 psi and the shower valve, or 41 psi at the valve. (Note: these data are based on procedures found in the National Plumbing Code. Other procedures from varying sources would yield even greater pressure losses and lower flow rates.)

There is an additional, and significant, pressure loss at the shower valve. For a two handled mixing valve, the pressure loss will be approximately 1- 5 psi (this will vary with the type of valve and the flow rate delivered to the valve -- the greater the flow rate delivered to the valve, the greater the pressure loss through the valve). For a pressure balancing valve (approximately 17% of shower valve sales) the pressure loss through the valve is 5-30 psi depending on water pressure at the valve. A single handled valve (about 33% of shower valve sales) will produce a pressure loss of 5-15 psi.

For the purposes of this example, we will assume a 5 psi pressure loss because of the shower valve. This brings the "real world" flowing pressure down to 36 psig. The average of the sample of tested shower heads provided 2.13 gpm flow rates at 40 psig. At 36 psig these same shower heads would give an average flow rate of 2.02 gpm.

The typical shower user is utilizing a flow rate of 2.02 gpm from existing water conserving shower heads designed to current industry standards. Why, then, is there a need for a law requiring shower heads to flow at any particular rate? Industry is already providing products which provide greater water conservation than contemplated by the Senate bill. This has been done without interference or leadership from the federal government.

Replacement Rates

An issue that has been raised by proponents of federal legislation is the length of time it takes to convert existing installations to new technology, i.e. it takes so long that federal action is required immediately to begin saving water. PMI would disagree with the central issue because there is no need for federal action since the industry has already taken the action required by the National Plumbing Products Efficiency Act of 1989. We would concur, however, that there is a length of time between the general availability of new technology and its replacement of existing technology in buildings already in place.

With respect to shower heads this length of time is between 7-10 years. Appendix C contains the data on which this estimate is based. Generally, there are more than 15.5 million showerheads sold in the U.S. annually (including imports). Approximately 1.746 million are needed for new residential construction. Approximately 6% of the total is estimated to be used in new nonresidential construction (hotels, motels, institutions, etc.). This leaves 12.8 million shower heads used to replace existing heads. We also conclude that there are 98.3 million shower heads already installed in residential units nationwide. Thus, most shower heads are replaced every 7-10 years.

Historic Water Savings

By 1979 virtually all faucets, shower heads and water closets manufactured in the United States were of the water conservation type (maximum flow rate of 3.0 gpm for fittings and 3.5 gpf for water closets). The trend to these products started much earlier -- in the early and mid '70s, but the change over to low flow and low flush products was nearly complete by 1979. Since this paper deals with flow rates for fixture fittings -- specifically, shower heads -- we can make a projection of current water savings by low flow shower heads. We will utilize data from several sources discussed in this paper or in its appendices.

As documented above, it takes approximately 10 years to replace the existing stock of installed shower heads in residential construction. Since nearly 100 % of shower heads sold since 1979 have been low flow models, 1989 is the point at which virtually all shower heads currently installed in the U.S. are low flow models.

From what flow rate level, however, do we make our comparison? Nonconserving shower heads in the HUD study had an average flow rate of 4.8 gpm. However, consumers used them with less than a full open shower valve, and the average measured flow rates were only 3.4 gpm. A common assumption used by many investigators has been that preconservation shower heads used 5.0 gpm. In 1977 PMI provided a listing of shower heads and their flow rates at 40 psi. Thirty three (33) shower heads averaged 5.54 gpm. To err on the side of conservatism, we will use the 3.4 gpm for our calculations even though we would speculate that by 1983 (when the HUD data was gathered) user habits had become more conservative with respect to water use.

There are 250,000,000 people living in the United States. According to the HUD study, 67.25% of the population takes only showers (no baths). This does not include persons who, periodically, take showers in addition to baths. This

67.25% takes an average of 5.2 showers a week for an average duration of 10.4 minutes.

The only other data needed to calculate water savings is to determine at what flow rate are persons now taking a shower? The HUD study shows the flow rate for conserving shower heads at an average of 1.9 gpm. From our own calculations above, the average shower flow rate is 2.02 gpm. The difference may be that we assumed conservative pressure losses between the water main and the shower head and we assumed that the shower valve was opened full.

With these data we can make a very understated estimate of total shower water use and savings. Sixty seven and 25/100 percent of the population equals 168,125,000. These people are taking 5.2 showers per week, or 45,461,000,000 per year. Each shower lasts for 10.4 minutes. People are showering for 472,794,400,000 minutes per year. With conserving type shower heads, they are using 955,044,688,000 gallons of water. With nonconserving heads they were using 1,607,500,960,000 gallons annually. Over the ten year period, 1980-1989, assuming a 10% annual shower head replacement rate, industry and state/local government initiatives have been responsible for saving 3,588,509,496,000 gallons of water from shower heads alone! The annual savings in 1989 alone would provide all of the City of New York's water needs for 435 days!

Conclusions:

This paper has concentrated on shower heads. The same scenario could be properly repeated for faucets. There has been substantial water conservation from faucets as well as shower heads since the 1970's. These accomplishments by industry -- manufacturers, designers, builders, and installers -- have already outstripped the efficiency of the proposed regulations of the federal government through S. 583. This is possible because industry is accountable to the buyer/user of these plumbing products.

Minimum, workable shower head flow rates are already being supplied to consumers by the plumbing industry. Changes crafted and forced on the industry and its consumers outside the market mechanism are simply not going to work. Industry, in partnership with state and local governments, has already been meeting public policy needs with respect to water conservation.

## B. CURRENT REGULATORY COVERAGE

Building officials throughout the United States were recently contacted to determine the national extent of water conservation regulations pertaining to plumbing fixtures/fittings. (See "Research Methodology" below.) Special attention was paid to national consensus standards (ANSI A112.19.2 and A112.18.1), and model plumbing code references. (See Note 1 below.) This research has determined that such regulations exist in 49 of the 50 states, and in the District of Columbia. The data obtained from the building officials has been applied to national population figures, (U.S. Bureau of the Census, 1980), to demonstrate that a total of 92.2% of the population of the United States (208,893,660 of 226,547,346) is currently living under water-conserving plumbing product laws. Only one state, Arkansas, was found to have no specific regulations although state officials will consider them in the near future and have invited the Plumbing Manufacturers Institute to attend meetings on the subject.

These water-conserving regulations were found to take one of the following forms:

I. State laws which mandate compliance with either a model plumbing code or a state-written code which contains water-conserving requirements for fixtures/fittings. These 33 states contain 69.6% of the total population, or 157,488,175 of 226,547,346. Of these 33 states, 23 have adopted a model code, 8 have state-written codes which require plumbing fixtures/fittings to comply with ANSI standards, and 2 have specific water-saving product criteria. Legislation to adopt a model code typically reads: "The department ... shall adopt by reference a nationally recognized plumbing code. ... The department ... may adopt, as necessary, amendments to that code. ... this does not preempt the authority of municipalities ... to adopt more restrictive ordinances." (See Note 2 below.) The state-written codes' language which required compliance with ANSI standards was generally found in tabular form, listing recognized standards for products. An example of this form is shown in Attachment A. Specific water-saving product criteria generally followed the restrictions shown in Attachment B hereto. It should be noted that some areas within a state may have more stringent requirements, such as in Kentucky: the contact person stated that some counties mandate use of no more than 1 gpf water closets for homes on septic tank systems.

II. State laws which do not mandate state-wide code compliance, but do specifically define water-conservation with respect to plumbing fixtures/fittings. These two states, Georgia and Pennsylvania, account for another 6.4% of the total population, or 14,361,026 of 226,547,346. (Several states which were included in category I. above also have specific laws of this type, in addition to their other requirements.) See Attachment B for typical language.

III. States within which municipalities or other jurisdictional bodies have adopted water-conserving regulations. These 14 states account for 15.1% of the total population, or 34,019,169 of 226,547,346. The forms of these ordinances varied from location to location, but typically followed one of the formats discussed above.

IV. A state which achieves water-conservation by requiring plumbers to install in accordance with one of the model codes, and control such installations through certification and licensing of plumbers. This state, Oklahoma, accounts for the remaining 1.1%, or 3,025,290 of 226,547,346.

Additionally, this research found that the remainder of the population is indirectly covered by water-conserving standards through manufacturers' awareness of and compliance with the model code requirements in their product designs.

NOTES:

1 The four model codes are as follows:
- -Building Officials & Code Administrators International, Inc., (National Plumbing Code)
- -International Association of Plumbing & Mechanical Officials, (Uniform Plumbing Code)
- -National Association of Plumbing-Heating-Cooling Contractors, (National Standard Plumbing Code)
- -Southern Building Code Congress International, (Standard Plumbing Code)

2 From the State of Maine, Title 22 MRSA Section 42, paragraph 3, as amended by Chapter 483 of public law, June 27, 1989.

RESEARCH METHODOLOGY FOR CURRENT REGULATORY COVERAGE

A telephone survey of plumbing code officials in all fifty of the United States and the District of Columbia, was conducted from September 29, 1989, through October 19, 1989. Points of inquiry include the following:

1. Does the state law mandate use of a model plumbing code? If so, which one?
2. If there is no model code requirement, does the state mandate use of a state-written plumbing code? if so, does this code reference ANSI standards, or prescribe use of water-conserving plumbing products?
3. If there exists no state-level regulations, what percentage of the state's population is regulated at some jurisdictional level, i.e. municipal, county, or other? In what form?

The information gleaned from these responses was then correlated with 1980 Bureau of the Census figures to obtain percentages of the population covered by some form of water-conserving plumbing product laws. Sources of the contacts to obtain data included the following:

I. Plumbing Code officials listed in the "1989 Directory of Building Codes & Regulations", Volumes 2 through 5, a publication of the National Conference of States on Building Codes and Standards, Inc.,

II. Previous contacts contained in the "Model Code Use by States" listing, as compiled during the period of Febuary, 1989 through April, 1989 by JR Lancaster, CM Services, Inc.,

III. Legal counsels for some agencies involved in plumbing code enforcement,

IV. Governors' "action lines" or various high-level officials when so referenced by plumbing code officials for that state, and

V. Various legislative information hotlines (to obtain copies of the pertinent legislation).

## C. ACTIONS OF ANSI, A112 COMMITTEE, PANEL 18

The subject of further reductions in flow rates for faucets and showerheads is being discussed by Panel 18 of the ASME (ANSI) A112 Committee. In March, 1989 a proposal was made by Mike Martin of the California Energy Commission to lower the flow rates from 3.0 to 2.5 gpm. The motion died for lack of a second, because Panel members did not feel prepared to discuss the subject. It was agreed that they would be prepared at the subsequent meeting, which was held on October 3, 1989. At that meeting, the Chairman (a manufacturer) proposed revisions to the kitchen and lavatory flow rates reducing them from 3.0 to 2.5 gpm. In the discussion, several Panel members, representing different interests, expressed concern that the plumbing system pressures, by code, can be as low as 8 psi, and that product performance would be very poor. It was agreed to form a Working Group of 3-4 people to review the possibilities and make a recommendation to the Panel on flow rate revisions at its next meeting, scheduled for December 14. A second Working Group is being formed to study the question of showerhead flow rate reductions and the implications involved. That Working Group must file an interim report with the Panel at the December meeting, and propose final language for revisions to the standard (A112.18.1 - Plumbing Fixture Fittings) by May 1990.

Panel 18 currently has 15 members, whose interests are categorized as follows: Four water or energy conservation regulators (one of these has changed employment recently, and would now be classified as General Interest), three regulators (codes, US Government), 3 General Interest, and 5 manufacturers. The Panel is fairly well balanced, and manufacturers do not dominate the discussions. It should be noted that two of the four water/energy conservation interest members have had some input to the Atkins and Fowler bills, but have not made any proposals to Panel 18 to revise the standard, to date. Why are they members of the standards committee when they request Federal legislation before they have even tried to make changes through the existing standards and codes system?

## D. COMPARISON OF S.583 TO THE NATIONAL APPLIANCE ENERGY CONSERVATION ACT

Proponents of S.583 have suggested a direct parallel exists between the structure of S.583 and the National Appliance Energy Conservation Act. The only similarity is that both regulate products.

1. NAECA represents a negotiated settlement between environmentalists and manufacturers. Manufacturers were faced with a growing dissimilarity among state energy efficiency regulations. This costly and inefficient system needed to be changed for the benefit of the consumer who would suffer because of unnecessarily higher product costs. The plumbing industry has dealt with this same situation throughout its history. Manufacturers currently expend enormous resources coordinating plumbing code requirements among the thousands of jurisdictions regulating plumbing products. American National Standards and model plumbing codes are this industry's NAECA. They represent the vehicle to coordinate product and plumbing code requirements nationwide. The system imposed by S.583 would only add another layer of regulation and bureaucracy to the existing system. It would remove absolutely no existing requirements relating to plumbing codes.

Whereas NAECA relieved enormous inefficiencies in the market place, S.583 simply adds additional inefficiency and confusion.

2.) Manufacturers of appliances wanted NAECA. There are few, if any, local requirements for appliances. Regulation was at the state level. NAECA coordinated requirements of 50 governmental units -- the states. S.583 does that too, but ignores the authority of approxmiately 16,000 state and local governmental units to set plumbing code and plumbng product requirements beyond the scope of S.583. The plumbing industry does not want S.583 because it does not serve the needs of the industry or its consumers.

3.) Like NAECA, S.583 regulates products. The enormous mistake of this legislation is its attempt to regulate components of a complex system without any regard for the impact on the system itself.

Water conservation through regulation of plumbing products is not comparable to the appliance energy conservation in electrical systems due to some very basic differences between the systems.

The electrical distribution system is designed with electrical wires on conduits large enough to supply a constant voltage or pressure to each outlet. Because of

this, electrical appliances can all operate from the same base line in determining energy efficiency, and the actual usage in homes is comparable, provided the appliances are used optimally. Predictions of energy savings can be made with some degree of accuracy using some assumptions on actual usage habits. Electricity or gas is expensive enough to encourage conserving habits among users.

In the plumbing system, the pipes or conduits are rarely large enough to supply a constant pressure at each outlet regardless of how much volume is drawn. To make the pipes large enough would be very expensive in terms of building costs. Further, larger pipes would require much more wasted water until the larger volume in the hot water line was drawn off and hot water delivered to the outlet. This would waste both energy and water. Water is not often priced to encourage conserving behavior by the user.

In a water utility distribution system, the water pressure delivered to a house may vary from 20 or 25 psi to 150 psi depending on the proximity to the pumping or booster pump station. The pressures above 80 psi are reduced with pressure reducing valves. Homes on well systems typically have a 35 psi static pressure, which can easily fall to 10 to 20 psi when the water is running. Plumbing codes call for plumbing engineers to design for an 80 psi maximum to 8 psi minimum in building water system design. Therefore, in a high rise apartment building or hotel, pressures can vary greatly from floor to floor, depending on how many booster pumps are installed. This wide variety of pressures creates significant challenges to the designers of faucets, showerheads and water closets in providing adequate performance in all cases.

It can be easily seen that the pressure to a faucet or showerhead can vary greatly, and that the designer of faucets and showerheads must provide for adequate product performance at both high and low pressure extremes. There is very little, except trouble, to be gained by federal control of a few components of a complex system without regard to the system itself. If controlling water use by toilets and other plumbing products is so important, S.583 should be broadened to create an entire federal plumbing code.

## E. LEAD TIME TO DESIGN NEW WATER CLOSETS TO ACHIEVE 1.6 GALLON PER FLUSH PERFORMANCE

New plumbing products do take time to develop before they are ready for the market place. PMI asked manufacturers to provide a general idea of how long this process takes for one product -- in this case, a water closet. The result is Appendix D, a Gantt chart showing the steps and time needed to develop a new water closet. PMI's instructions were to provide a very normal estimate, neither cutting down the time line to show a "crash" program, nor extending it to show worst case.

The following table is an expanded version of testimony provided by P.J. Higgins on October 4 before the Subcommittee. It illustrates the complexity of the plumbing fixture industry with respect to water closets. Virtually all manufacturers now have 1.6 gpf water closets in the designs which make up the vast majority of the market volume. The less frequently used fixtures will be connected more slowly to the 1.6 gpf configuration.

| Type/Common Usage | Approx % of Total Production | Approx # of 1.6 gpf Products Available |
|---|---|---|
| Flush Tank Type: | | |
| A 2 Piece, close-coupled (Note) | | |
| 12" Rough | 75% | 20 |
| 10" Rough | 1% | 2 |
| 14" Rough | 1% | 2 |
| (Most common type; used in all applications except hi-rise.) | | |
| B 18" close-coupled for Handicap/Elderly | 1% | 1 |
| C Floor Mounted Back Outlet (Note) | 2% | 1 |
| (Used in hi-rises, hotels/motels.) | | |
| D Wall Hung, close-coupled | 1% | 0 |
| (Commercial/Industrial applications) | | |
| E One-Piece (Note) | 7% | 3 |
| (Used in private homes & hotels) | | |
| Flushometer Valve Type: | | |
| F Floor Mounted (Blowout and Siphon Jet) | 8% | 1 |
| (Used in most public access restrooms) | | |
| G Wall Hung (Blowout and Siphon Jet) | 3% | 0 |
| (Used in most public access restrooms where tampering is a possibility) | | |
| H 18" for Handicap/Elderly | 1% | 1 |

Note: Available in round or elongated styles.

PMI Supplementary Submittal on S.583; Page 15

This report and the attached documents effectively show that PMI, since as long ago as 1977, has proposed and supported the idea of standards which would:

1- Conserve our supply of potable water in areas where water is still in short supply;

2- Permit additional construction and provide higher standards of living in areas where sewage disposal is a problem;

3- Reduce energy consumption for hot water heating throughout the nation.

A review of this material demonstrates the consistency of our position during this period. It also shows that this approach is working. The plumbing industry has responded to the needs of the marketplace and the water conservation needs of the nation are being met -- through consensus, not federal governmental regulation. It is our firm contention, and honest belief, that the federal government's intervention in this process is not only unnecessary, but would create new problems and seriously disrupt the marketplace.

There is an old saying, widely used in the construction industry: "If it ain't broke, don't fix it!" If ever there were a situation where that old saying applied, it is this one.

## APPENDIX A

**Water pressure:**

Water pressures supplied by water companies do vary widely. There are documented cases of water pressures in mountainous areas running from 125 pounds per square inch (psi) in low areas to 10-15 psi in higher elevations. Water works companies spend huge sums of money building and maintaining storage and pumping equipment to provide users with adequate water pressure for normal needs. This discussion is limited to water pressures for residential uses and specifically does not address industrial or other specialized needs.

It is very difficult to find sources to address "typical" water pressures. However, to accomplish a general analysis of water use by shower heads, a base line, typical water pressure must be established. The pressure we have chosen is 50 (fifty) psi. Why? The number is a consensus figure based on the following information:

1.) We are told by The American Water Works Association that a standard issued as "A Report of the Committee of the Great Lakes -- Upper Mississippi River Board of State Sanitary Engineers," in 1982 and called, "Recommended Standards For Water Works," has become the generally accepted de facto standard.

Section 7.3.1 of that standard says, "The maximum variation between high and low levels in storage structures providing pressure to a distribution system should not exceed 30 feet. The minimum working pressure in the distribution system should be 35 psi and the normal working pressure should be approximately 60 psi...."

Section 8.1.1 of the standard says, "All water mains, including those not designed to provide fire protection, shall be sized after a hydraulic analysis based on flow demands and pressure requirements. The system shall be designed to maintain a minimum pressure of 20 psi at ground level at all points in the distribution system under all conditions of flow. The normal working pressure in the distribution system should be approximately 60 psi and not less than 35 psi.

2.) In a paper entitled, "Fresh Water", Delwyn Davies described the New York City water system "...Nearly all water enters the zones under gravity at a pressure of about 50 pounds per square inch, which is sufficient to lift water to the top floor of four-story buildings...."

3.) In the HUD study (See Appendix C) of household water use the effect of lowering water pressure (in the water

main) were studied. Three small areas of Denver, Atlanta, and Los Angeles were selected for the study. In Denver, water pressures ranged from 110-35 psi; in Los Angeles pressures had been increased from below 60 psi to nearly 100 psi by recent water system improvements. In Atlanta the area monitored was believed to have water main pressures of 115 psi. A pressure regulating valve was placed on the water main serving the subdivision lowering pressures to 85 psi. The area is hilly, so pressures were not consistent. Predicted pressures were from 50-85 psi. A pressure check of selected homes found actual pressures in the home to be 25-30 psi less than expected.

4.) The "Final and Comprehensive Report for Cabin John Drainage Basin Program" by the Washington Suburban Sanitary Commission found water savings by reducing main pressures to an average of 50 psi.

5.) The noted plumbing systems design engineer, Alfred Steele, in his book, "Engineered Plumbing Design", provides the following information in the chapter on water system design: "As previously noted, lack of adequate pressure is one of the most frequent complaints and could be the cause of serious troubles. The pressure available for water distribution within a building can come from various sources. Municipalities usually maintain water pressure in their distribution mains within the range of 35 to 45 psi....When utilizing only the public water main pressure for the water distribution system within a building, it is very important to determine the pressure available in the mains during the summer months. Huge quantities of water are used during this period for sprinkling of lawns and for air conditioning cooling tower make-up water which usually cause excessive pressure loss in the mains....It is good practice to assume a pressure available for design purposes as 10 psi less than the utility quotes."

* * * * *

There are obviously pressures above and below 50 psi in water mains. It appears that the use of 50 psi provides a sound mid range number for generalization so that errors above and below 50 psi tend to offset each other. Another approach to this issue would have been to assume pressures would be equally distributed at 20, 50, and 80 psi. However, any improvement in calculated results would be marginal at best.

## APPENDIX B

**Data and Assumptions:**

An estimated 15,500,000 shower heads were sold in the United States in 1988. This conclusion is based on industry statistics as compared to the Bureau of the Census preliminary industry Census of Manufacturers for 1987. In addition private market studies were used to estimate the number of shower heads sold through retail outlets. Data from the Customs Service show 2.775 million of the total are imported.

From the total number of shower heads sold, two factors were subtracted to estimate the number going into replacement in dwelling units. We estimated that 6% of the total was used for nonresidential construction -- hotels, motels, institutions, etc. We also estimated that 1.746 million of the total was needed for the new home construction market on an annual basis.

There were 1.123 million housing units completed in 1987 according to the Bureau of the Census. Census also shows that 112,300 of these units had one or less bathrooms; 78,610 had 1 and 1/2 bathrooms; 505,350 had 2 bathrooms; and 426,740 had two and 1/2 or more bathrooms. We assumed the following for each category: Of the units with one or less bathrooms, 1/2 had showers; one and 1/2 baths, all units had one shower; two baths, all units had 1 and 1/2 showers; two and 1/2 baths (or more), all units had 2 showers. These assumptions yield 1,746,000 shower heads used in new housing unit construction in 1987.

Thus, the total number of shower heads used to replace existing shower heads is 12,816,560.

From Census data we know that nearly 90,000,000 dwelling units now exist in the United States (as of 1985). Of these, 54,577,000 have one bathroom; 16,125,000 have one and 1/2 bathrooms; 27,448,000 have two or more bathrooms. We assumed that 1/2 the units with one bath had showers; all units with one and 1/2 baths had showers; and all units with two or more baths had 2 (two) shower heads. Based on these assumptions, there are 98,309,500 shower heads installed in existing dwelling units in the United States.

Consequently, it would take 7.67 years to replace all existing shower heads comparing installations to the number of new shower heads available from industry for replacement purposes.

To gain a perspective on flow rates for shower heads currently on the market, we asked PMI member companies to

send test results for shower heads flow rates at different water pressure. Data on 29 shower heads were analyzed with flow rates at pressure ratings beginning at 15 psi and at 10 psi increments between 20-80 psi (Not all heads were tested at each pressure rating). In addition, we separately tested 6 other shower heads to provide additional input. Some of the heads had pressure compensating flow reduction mechanisms and some had fixed orifice flow reduction devices. Several of the heads were of the pulsating variety (flow rates of the pulsating heads did not vary from their own nonpulsating modes). The average flow rate of all shower heads at each pressure rating is:

| | |
|---|---|
| 15 psi | 1.45 gpm |
| 20 psi | 1.62 gpm |
| 30 psi | 1.95 gpm |
| 40 psi | 2.13 gpm |
| 50 psi | 2.45 gpm |
| 60 psi | 2.36 gpm |
| 70 psi | 2.60 gpm |
| 80 psi | 2.60 gpm |

These data were gathered under the ANSI standard flow rate test and cannot be related to street water main pressure. Water main pressures at these levels would yield lower pressures at the shower head as well as lower actual flow rates at the shower head.

## APPENDIX C

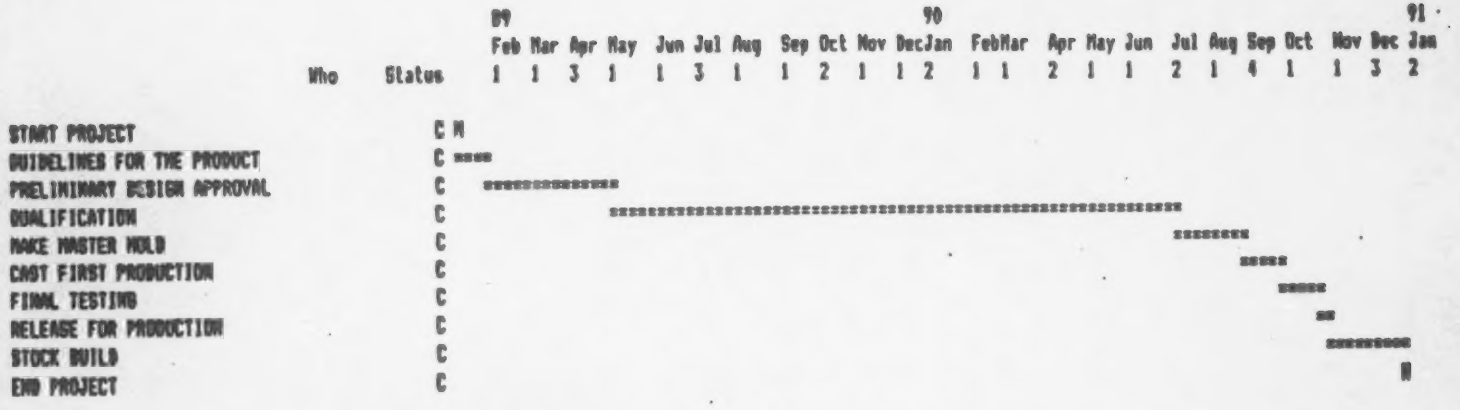
Conclusions of a HUD Study:

The most usable and credible data on actual water use by consumers for specific purposes such as showering appears to come from a study done by Brown and Caldwell for the U.S. Department of Housing and Urban Development, "Residential Water Conservation Projects Summary Report", June, 1984. These data begin to provide some reasonable quantitative analysis of actual user habits. It is certainly better than other generalized assumptions on the subject.

The HUD study would allow us to use a "real world" average flow rate of 1.9 gpm for water conservation shower heads. However, we have chosen to use higher numbers (depending on water pressure) for the purpose of this paper.

Other useful conclusions of this study include:
a.) 67.25% of the population takes showers only (as opposed to baths, but this does not include those individuals who take showers in addition to baths).
b.) The average number of showers per week per person is 5.2.
c.) The average duration of each shower is 10.4 minutes.
d.) The average flow rate of nonconserving shower heads is 3.4 gpm.
e.) The average flow rate of conserving shower heads is 1.9 gpm.

Schedule Name: Generic toilet development Gantt chart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90
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Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Jan
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Who
Status
START PROJECT
GUIDELINES FOR THE PRODUCT
PRELIMINARY DESIGN APPROVAL
QUALIFICATION
MAKE MASTER MOLD
CAST FIRST PRODUCTION
FINAL TESTING
RELEASE FOR PRODUCTION
STOCK BUILD
END PROJECT

| | | |
|---|---|---|
| D Done | === Task | - Slack time (==---), or |
| C Critical | +++ Started task | Resource delay (---==) |
| R Resource conflict | M Milestone | ) Conflict |
| r Rescheduled to avoid resource conflict | | p Partial dependency |

TIME LINE Gantt Chart Report

Senator BRYAN. Thank you very much, Mr. Selover.
Mr. Gants.

**STATEMENT OF ROBERT M. GANTS, VICE PRESIDENT, GOVERNMENT RELATIONS, ASSOCIATION OF HOME APPLIANCE MANUFACTURERS**

Mr. GANTS. Thank you, Mr. Chairman.

I am Robert Gants. I am Vice President of Government Relations of the Association of Home Appliance Manufacturers.

We represent the manufacturers of virtually all dishwashers and clothes washers sold in the United States, among other products that you find in your kitchen and in your home laundry room.

I want to point out that, unlike the products that have been discussed, total water usage of clothes washers and dishwashers is very small—0.13 percent for dishwashers and 1.5 percent for clothes washers, equaling a total of 1.6 percent of all water consumed nationwide.

Let us take a look at dishwashers. As a matter of fact, if you really wanted to save water you could mandate that every household purchase a dishwasher. A recent Ohio State University study reports that consumers who used a dishwasher and did not prerinse their dishes averaged 5.8 gallons less water per test load than consumers who washed their dishes by hand.

The point is that you can save water with a dishwasher by operating the machine only with full loads, not rinsing or washing by hand, using the short wash cycle for lightly soiled loads, and loading the machine correctly.

Manufacturers promote water conservation through the use and care manuals that are distributed with the product.

Looking at clothes washers for a minute, 98.5 percent of all clothes washers shipped in 1987 provided consumers with a water level switch which allowed the consumer to use only that amount of water needed for a particular load. One of the reasons why that water level switch is on the product is because consumers want it on the product. They want to be able to set the water level to match the size of the load they are washing.

Again, through the use and care manuals we promote water conservation.

Energy consumption, water consumption, and performance are closely linked. Dishwashers and clothes washers are currently regulated under the National Appliance Energy Conservation Act. In response to energy conservation needs, dishwasher and clothes washer manufacturers have reduced the energy consumption of their products since 1972 by 36.2 percent and 28.9 percent, respectively.

We have carefully balanced the need to retain satisfactory performance and reduce water use whenever possible. Further regulation of water use could have a serious negative impact, not only on performance, but on energy consumption. In short, energy consumption and water use and performance are linked.

Congress would ill serve the consumer and the cause of water conservation if it mandates technical changes that, in the name of

water conservation, produce appliances that perform basic household tasks less well and less reliably.

Insufficient water in clothes washers could result in poor agitation, increased wear and tear on the laundry, redeposition of suds, reduced lint removal, and overall poor washing results. And in dishwashers it could result in starving of the water circulating pump, ineffective water distribution, redeposition of food on dishes, inadequate removal of stains, fats and grease.

Let me talk for a moment about the labeling provisions in this bill. We doubt that water consumption information on labels would be very helpful to the consumer. For example, the differences in water cost between the least and most water consumptive standard-sized dishwashers only varies by $1.30 per year.

In addition, the requirement for each component of a product to bear a permanent marking with the manufacturer's name and water use of the product would be overly burdensome. These products are already labeled with energy guides. Rather than adding another label on water usage at the point of purchase, which would show little difference between competing products, conservation efforts are best directed in our judgment towards informing the consumer of water saving techniques in using the product, which we do.

Appliance manufacturers provide and will continue to promote smart use practices for the purpose of saving water.

In summary, the Association recommends that, in view of the small percentage of water consumed by these appliances and the correspondingly small opportunity to achieve water conservation, that Title II of this bill, "Water use standards for automatic dishwashers and clothes washers," be deleted from S. 583. In addition, we request that dishwashers and clothes washers be specifically exempted from coverage in other sections of the bill where federal agency authority is provided to issue rules on water use, labeling, testing and conservation standards for other "covered products," which are not now specified in the legislation.

Thank you, Mr. Chairman. That concludes my statement.

Senator BRYAN. Thank you very much, Mr. Gants.

Mr. Higgins.

## STATEMENT OF PATRICK J. HIGGINS, PRESIDENT, P.J. HIGGINS AND ASSOCIATES, INC.

Mr. HIGGINS. Mr. Chairman, my name is Patrick J. Higgins. I am President of P.J. Higgins and Associates, Incorporated, a consulting agency in Frederick, Maryland. The motto of our firm states we are the "Consultants to the most vital industry in the world."

We truly believe that our industry, the plumbing industry, has served the nation for many decades in protecting public health through the conveyance of water to and waste from our homes, places of worship, businesses, and the work place.

I have been asked to comment on S. 583. As background for my analysis, I offer 22 years as a licensed plumber and 14 years of experience in codes and standards development. I have authored twelve books on plumbing apprenticeship training and two books

on the subject of plumbing codes. I just happen to be one plumber that Senator Fowler did not talk to.

For the past nine years our consulting agency has labored many hours and expended many dollars assisting in the development of new technologies and promoting the implementation of these developments into the mainstream of plumbing codes throughout our country. Part of our efforts have been dedicated to development and promotion of low consumption products, such as water closets, urinals, lavatories, and sink fittings and showerheads.

As chairman of the ANSI-ASME A112 committee for plumbing product standards, I have had the good fortune to witness firsthand the evolution of these products and to envision the benefits which could be reaped in application of this new technology.

Despite my satisfaction with the performance of many of these low consumption products, I speak against adoption of this bill, for the following reasons:

First, the bill fails to recognize that plumbing products are components of a total plumbing system, systems which must first be harmoniously balanced to protect public health and safety. Its finite restrictions on plumbing design create a severe burden on the owners of buildings which contain older plumbing systems.

Second, the bill fails to recognize the importance of our voluntary standards system in the development of provisions which protect public health and safety.

Third, the bill suggests that the Secretary of the Department of Commerce undertake the responsibility of tasks, at taxpayers' expense, which would duplicate the tasks that have been performed by testing and listing agencies for the past 20 years.

Fourth, the bill recommends the establishment and funding of a bureaucracy which will be redundant with the water conservation promotional activities which have been singlehandedly spearheaded by industry over the past 20 years.

Fifth, the bill fails to recognize the issues for which federal funding has been repeatedly requested, and that is for plumbing research.

Sixth, the bill supports the development of labeling provisions for manufacturers which are already being performed by many manufacturers, either because of revisions to the industry voluntary standards or in recognition of the public benefit of labeling.

Seventh, the bill fails to recognize the nuances of manufacturing plumbing products and the time required to develop, test, and perfect such products. For example, it takes two years to properly design and perfect a water closet design.

Eighth, the bill fails to recognize the inherent dangers of excessive flow restriction in showerheads, which may cause thermal shock.

Ninth, the bill fails to recognize the cost burdens to the consumer which are imminent with the retrofit of such products on existing systems.

And finally, product selection and freedom of choice are removed from the consumer.

Now, in general my findings are that the bill is duplicative in efforts that are already being performed by the industry. It is ignorant of the concepts for proper plumbing system performance. It

fails to recognize the importance of sanitary performance of plumbing products and systems. It demonstrates a lack of understanding with manufacturing practices relating to these products, and it is wasteful, as federal funds and taxpayer dollars would be appropriated to perform the duties which are already being performed by industry.

I would just like to elaborate on a couple of these issues. The direct correlation to the appliance efficiency act is not exactly true. Unlike an appliance, which there has been successful legislation, plumbing fixtures have to connect to a water supply and a waste system. They do not just plug into the wall.

They have to work in a harmonious system. This system is hydraulically designed to consist of fixtures, drainage piping, water supply piping. The water supply and drainage systems are sized and installed based upon the demands of the fixture. The tables for sizing these systems were developed, believe it or not, back in the 1930's and 1940's.

When the systems were designed by the National Bureau of Standards, specifically Dr. Roy Hunter, he had fixtures that used upwards of 80 percent more water than that which is presently proposed for the bill.

So therefore what we are suggesting with passage of the bill is that we are discharging into those system drain lines, which were designed for on the average of 65 percent more water, fixtures that will not uniformly carry what is necessary for proper system performance.

The possibility exists for more frequent stoppages, more consumer use of dangerous chemicals to clear stoppages, and exposure to the consumer of harmful disease from backed-up fixtures.

I would just like to also point out, for many years we have supported the efforts of the National Institutes of Standards and Technology to resurrect the work of Dr. Hunter, and NIST's efforts to obtain research funding were repeatedly denied.

Believe me, I am not against plumbing fixtures by a long shot. I have retrofitted my own home, but I made sure that the system was properly designed.

I would just like to say a brief word on the voluntary standards process. I was offended by the findings that stated that the standards process was not doing its job. I am the chairman of the committee. No one ever contacted me, no one.

What we look for in the development of standards is that public health and safety are protected, that fair competition to avert the possibility of a restraint of trade occurs, and that tort responsibility or liability for the product performance are all addressed within the voluntary standards process. These are absolutely critical things.

It does take time to develop standards because we have to address each of these issues. But believe me, the consumer is protected in the long run.

I feel that it is hard to put 22 years of plumbing experience in five minutes, but I thank you for reviewing my total report.

[The statement follows:]

STATEMENT OF PATRICK J. HIGGINS

Members of the Committee, Ladies and Gentlemen:

My name is Patrick J. Higgins. I am President of P.J. Higgins and Associates, Inc., a consulting agency in Frederick, Maryland. The motto of our firm states "Consultants to the Most Vital Industry in the World." We truly believe that our industry, the plumbing industry, has served our nation for many decades in protecting the public health through the conveyance of water to and waste from our homes, places of worship, businesses and workplaces.

I have been asked by your Committee to convey my thoughts on Senate Bill S.583. As background for my analysis, I have mustered my sixteen years as a licensed master plumber, which was attained after four years as a registered apprentice and two years as a licensed journeyman. During this twenty two years in the trade, I designed, installed, and maintained thousands of plumbing systems. I have authored twelve books on plumbing apprenticeship training and two books on the subject of plumbing codes. Further, I offer my experiences in codes and standards development for the past fourteen years in the areas of plumbing fixture and fitting design, plumbing drainage and venting, water distribution systems, and performance testing of the plumbing products which are addressed in the legislation.

For the past nine years, our consulting agency has labored many hours and expended many dollars assisting in the development of new technologies and promoting the implementation of these developments into the mainstream of plumbing codes throughout our country. Part of our efforts have been dedicated to the development and promotion of low consumption water closets, urinals, lavatory and sink fittings, and showerheads. As chairman of the ASME/ANSI A112 Committee for Plumbing Product standards, I have had the good fortune to witness firsthand the evolution of these products and to envision the benefits which can be reaped in application of this new technology. Others, particularly those who have sponsored this legislation, have also foreseen the benefit for future generations with the implementation of these products. The mandatory requirement of low consumption products is mathematically supported with promises for savings of many gallons of water. With proper operation and maintenance of such devices on properly designed systems, these savings figures have some legitimacy.

Despite my satisfaction with the performance of many of these products, I speak against the adoption of S.583 for the following reasons:

(1) The Bill fails to recognize that plumbing products are components of total plumbing system - systems which must be harmoniously balanced to protect the health and safety of the consumer. Its finite restrictions on plumbing design creates a

severe burden on the owners of buildings which contain older piping systems.

(2) The Bill fails to recognize the importance of our voluntary standards system in the development of provisions which protect public health and safety.

(3) The Bill suggests that the Secretary of Department of Commerce undertake the responsibility of tasks which would duplicate the tasks which have been performed by testing and listing agencies for the past twenty years.

(4) The Bill recommends the establishment and funding of a bureaucracy which will be redundant with the water conservation promotional activities which have been single-handedly spearheaded by industry over the past ten years.

(5) The Bill fails to recognize the issues for which Federal funding has been requested for many years, that is, in plumbing research.

(6) The Bill supports the development of labelling provisions for products, which are already being performed by many manufacturers either in anticipation of revisions to standards or in recognition of the public benefit for better labeling.

(7) The Bill fails to recognize the nuances of manufacturing plumbing products and the time required to develop, test, and perfect such products.

(8) The Bill fails to recognize the inherent danger of excessive flow restriction in showerheads, which may cause scalding and falls.

(9) The Bill fails to recognize the cost burdens to the consumer which are eminent with retrofit of such products on existing systems.

(10) Product selection and freedom of choice are removed from the consumer.

In general, my findings are that the Bill is (1) duplicative with efforts already being performed by industry; (2) ignorant of concepts for proper plumbing system performance; (3) fails to recognize the importance of sanitary performance of plumbing systems; (4) demonstrates a lack of understanding with manufacturing practices relating to these products.

Allow me to elaborate on each of the issues pertinent to my objections:

(1) The Importance of a Unified Plumbing System.

A plumbing system is a hydraulically designed arrangement consisting of fixtures (such as water closets and urinals) and fixture fittings (such as lavatory and kitchen sink faucets) which are married to a properly sized water supply piping (to convey water to the fixture fittings) and a properly sized drainage waste and vent or DWV system (which safely carries human wastes away from the building).

The water supply and drainage systems are sized and installed based upon the demands of the fixture. A fixture with a high demand such as a flushometer valve, blowout water closet requires both larger water supply (1-1/2") and drainage piping (3") because of its need to thoroughly cleanse this public use toilet fixture. On the other hand, a residential lavatory requires small water lines (3/8") and small drain lines (1-1/4"), as its needs are far less.

The tables for sizing plumbing systems for both water and drainage piping were prepared in the 1930's and 1940's by Dr. Roy B. Hunter of the National Bureau of Standards (now called the National Institute of Standards and Technology). In his studies, Dr. Hunter established water and drainage pipe sizing systems for both public and private building uses. His tables were based upon factors of consumption, frequency of use and product type. The water consumption of products which were tested by Dr. Hunter are shown in Table 1. We have also shown other water consumption values of products developed since the 30's and 40's, and the percentage of reduction against this reference base (1930-1940).

TABLE 1
WATER CONSUMPTION OF VARIOUS PRODUCTS
(Percentage of reduction from the base years is shown in parenthesis)

| Product | Base Years 1930-1940s[1] | 1960-1975[2] | 1975-1985[2] | Proposed[2] |
|---|---|---|---|---|
| Water Closet | 7.0 gpf | 5.0 (29%) | 4.0 gpf (43%) | 1.6 gpf (77%) |
| Urinal | 5.0 gpf | 3.0 (40%) | 1.5 gpf (70%) | 1.0 gpf (80%) |
| Lavatory | 5.0 gpm | 4.0 gpm (20%) | 3.0 gpm (40%) | 2.0 gpm (60%) |
| Kitchen Faucet | 5.0 gpm | 4.0 gpm (20%) | 3.0 gpm (40%) | 2.5 gpm (50%) |
| Showerhead | 9.0 gpm | 5.0 gpm (44%) | 3.0 gpm (60%) | 2.5 gpm (72%) |

[1]Average consumption stated at 50 psi. Dr. Hunter's work on pipe sizing occurred during this time span.

[2]Values stated are maximum rates. Values stated at 80 psi, however, products are tested at 20, 50, and 80 psi.

The table shows that the products proposed to be mandated by the Senate Bill reduce consumption from 50%-80% against their 1930-40's base counterparts. Truly this proposal is quite exceptional - with one major reservation. We are now discharging low consumption products into a system which is designed to accommodate discharges with up to 65% more water. As a result, our present sizing is grossly oversized which in turn, lowers velocities in the drainage system flow. With lower velocities, wastes are less likely to travel as far and will separate from the effluent. This characteristic is not universal for all products, as some products produce a better mix/slurry of the wastes. But the possibility exists for more frequent stoppages, more consumer use of dangerous chemicals to clear the stoppages, and exposure to the consumer to harmful disease from backed-up fixtures.

There have been some experiences reported with the installation of low consumption products in new systems or with retrofit of buildings with relatively short lengths of drainage pipe. Some persons may testify today of the successful application of low consumption requirements in the Commonwealth of Massachusetts and other cities. Believe me, I hope that they are successful. But it is my firm belief with my twenty-two years in this industry that those who pass low consumption regulations without examination of the plumbing code sizing tables are invoking a great disservice to the constituents of their state, as only half of their responsibilities have been performed.

For many years, we have supported the efforts of the National Institutes of Standards and Technology to resurrect the work of Dr. Hunter and redefine the parameters for drainline sizing in buildings. NIST's efforts to obtain research funding were repeatedly denied in the battles for appropriation. Plumbing research at NIST is now non-existent. The industry has now embarked on these studies using private contributions, at no cost to the taxpayer. We want to know the answers to the drainline issue, so that the new technology products can be responsibly designed and installed to interface with a properly engineered drainage system.

(2) The Voluntary Standards Process.

When I read the Findings section of the Plumbing Products Efficiency Act, I was offended by the accusations made by the Bill's authors. The Bill states that "consensus standards have not kept pace with technology in change" and that "there are no uniform standards to assure that plumbing products are efficient and reliable so as to facilitate predictable and permanent improvements in the efficiency of water use in all jurisdictions." I find these statements offensive and blatantly false.

First, I am amazed at the issuance of such finding without the consultation of the Chairman of the American National Standards Committee - namely Mr. Patrick J. Higgins. I find it embarrassing to think that our governmental representatives would print such an accusation without verification of its truth or an analysis of the status of the standards.

Contrary to this Finding, we do have national consensus standards or final drafts under the voting process for all of the plumbing products identified in your Bill. Virtually every low consumption product manufactured presently has received approval for listing under the procedures in the standards. We are refining some standards on an annual basis to maintain their technological refinement.

The Bill proposes to assign this responsibility to the Secretary of Commerce, with assistance from NIST. For the life of me, I fail to comprehend why the Federal government would even consider appropriating funds to assign tasks of standards writing to duplicate or supercede the efforts of a voluntary effort which performs under consensus rules at no cost to the taxpayer.

Truly, the consensus process takes time as any attempt at consensus will. Our ASME standards groups represent a myriad of opinions from consumer and producer interests, including representatives from not less than four Federal agencies. We must honor all comments to improve the standards, including those recently submitted by NIST (eight pages of comments on two standards alone) and the Department of Defense (which is extensively cooperating with the voluntary standards process to phase out their standards). OMB Circular A119 requires the Federal use of voluntary consensus standards before the promulgation of governmental standards.

The ASME/ANSI standards process requires multiple levels of review. At any one level, the document can be sent back to the first level for resolution of an issue. On each level, we focus on (1) public health and safety to determine that the products do not create a public health nuisance; (2) fair competition to avert the possibility of restrain of trade; and (3) tort responsibility - to develop product performance tests to reduce the possibility of safety hazards to the consumer. Each of these focal points requires time for resolution - but this time is well spent - as the consumer is the beneficiary of our attention to detail.

Some of the issues which we have been studying relative to low consumption products are as follows:

Water closets - Drainline carry of wastes
- Staining and fouling of unwetted bowl surfaces

| | |
|---|---|
| | - Proper cleansing<br>- Water rise (splashing of the fixture user)<br>- Other refinement in existing bowl performance tests |
| Urinals | - Water exchange<br>- Surface cleansing |
| Showerheads | - scalding<br>- mechanical retention of restrictors<br>- flow rates |
| Lavatory and Sink Faucets | - flow rates<br>- backflow protection |

In all of the latest editions of the standards, we have or plan to add mandatory labelling requirements on the product and box which identifies the products flow rate or consumption values.

At all times, we welcome comments on our standards from any concerned party. We have already extended the comments and proposals in this Bill to the respective Working Groups for action.

(3) Product Approvals

As stated earlier, I know of only a few products which are experiencing major difficulties in obtaining approval for use in any jurisdiction. When we do hear of these difficulties, we have expended efforts to assist in the approval process.

However, we have insisted that products be evaluated against the performance requirements of the ASME/ANSI standards. Tests or regulations that only evaluate a product's water consumption, yet fail to examine the product's functioning performance are an insult to our industry's dedication to public health and safety.

(4) Establish Funding for Bureaucracy to Supervise and Promote Water Conservation and the Provisions of this Bill.

In my opinion, this concept is a waste of taxpayers dollars. The real pioneer work in water conservation has been done by the industry. The industry voluntarily changed the fixture fitting standard ASME/ANSI A112.18.1 standard in 1979 to require that all showerheads, lavatory and sink faucets be water conserving (not to exceed 3.0 gpm at a high pressure of 80 psi). The industry voluntarily converted 98% of its water closet designs from 1975 to the early 1980's to be water saving products (average of 3.5 gallons per flush). In cooperation with governmental agencies, the industry agreed to modify the ASME/ANSI standards to require

mandatory product/carton labels. Industry representatives from our firm and others have introduced provisions for water conservation and related technology into model, state, and local codes for the past fifteen years, and will continue to do so with advances in technology. Our efforts are consistent with sound engineering practice, and as important, are not a burden to the American taxpayer.

(5) Plumbing Research

As stated earlier, there is still a great deal of research necessary to properly usher the low consumption technology into modern construction. Due to the lack of Federal funds for such research, studies on drainline carry and loading have now been undertaken by various industry organizations. If the Senate desires to assist through the appropriation of research funds, please contact our offices for details.

(6) Labelling Provisions

We have expanded the requirements in the industry standards for labeling of both box and product as to flow rate and compliance with the standards. The box (carton) marking will assist the consumer, contractor, or engineer in product selection or specification; the product marking will simplify the plumbing inspectors task for easy identification of products required by the code.

(7) The Requirements of Manufacturing

The American plumbing fixture and fitting industry has always enjoyed a reputation for production of high quality, performance oriented product lines. This reputation has been deserved as extensive design, testing, redesign, retesting has accompanied the development, production and sale of every fixture and fixture fitting in our homes and offices.

For example, it takes approximately two years to develop, mold, test, and refine a water closet for the market. Vitreous china products such as water closets and urinals are particularly production sensitive, as they are molded and fired as many as three times to achieve consistency in the product design and finish. This production sounds easy, except for the fact that any one of forty conditions could cause a rejection of the product. First, the chinaware shrinks during firing upwards of twelve (12%) percent. Shrinkage causes distortion and distortion in a trapway may translate into the rejection of the piece.

With the implementation of the 1.6 gpf requirement, the hydraulic limitations of "what is possible" vs. "what is impossible" come into play. Any unintentional distortion may cause the production manager to reject total runs of product.

This distortion could be a factor of firing heat in the kiln (too hot or too cool), a bad mixture of ingredients, excessive humidity in the plant, a worn plaster mold, or countless other influences. Realistically, the product on the shelf today will not be the same as the same model one year from now as production refinements, quality control, and consumer reaction reformulate the product. It is easy to see that two years is a good benchmark for delivery of a product in order to perform the appropriate research and development.

As of the date of this testimony, it should be noted that not all manufacturers have products to meet with the provisions of this Bill. If the regulation were to become effective today, at least three chinaware manufacturers would be forced out of business. Further, many fixture fitting manufacturers would be scrambling to meet the new flow rate requirements.

Some product lines are not yet available and are not yet on the drawing boards. (See Table 2.) Some products can never be designed for 1.6 gpf maximum consumption. Blowout fixtures for example, will never be designed to function on 1.6 gallons of water. These fixtures are intentionally designed for high volume public use such as schools and stadiums. The blowout is designed with a larger trapway to lessen the possibility of a fixture stoppage. The larger trapway requires more water to function properly.

Table 2 An Analysis - Water Closet Types

| Flush Tank Type | Approx. % of Total Production | Approx. # of 1.6 gpf Products Available[2] |
|---|---|---|
| A[1] 2 Piece, close-coupled 12" Rough | 75% | 20[2] |
| 10" Rough | 1% | 2 |
| 14" Rough | 1% | 2 |
| B 18" close-coupled for Handicap/ Elderly | 1% | 1 |
| C[1] Floor Mounted Back Outlet | 2% | 1 |
| D Wall Hung, close-coupled | 1% | 0 |
| E[1] One-Piece | 7% | 3 |
| **Flushometer Valve Type** | | |
| F Floor Mounted (Blowout and Siphon Jet) | 8% | 1 |
| G Wall Hung (Blowout and Siphon Jet) | 3% | 0 |
| H 18" For Handicap/Elderly | 1% | 1 |

[1]Available in round or elongated styles.

[2]This constitutes one or two models per manufacturer. These manufacturers have not yet released any product.

Wall hung models are just now entering the drawing boards. Their rear outlet trapways require defined special attention to design functioning product. Although these products are only 3% of the total product market, they are mandated in some areas as the only acceptable product for public use as they are easier to clean under. If product does not become available by your deadline date, you also stand to liquidate the business of manufacturers who fabricate the pipe fittings which are necessary to install wall hung water closets.

(8) Potential for Scalding in the Shower

Recent studies by Delta Faucet Company and historical studies by Symmons Industries have demonstrated that the potential for scalding in the shower increases with each progressive restriction of flow in the showerhead.

It should be noted that showerheads are tested from 20-80 psi. These pressures reflect the lowest and highest pressures permitted by the codes for water supply systems. At the nationwide average water pressure of 45-50 psi (determined by the American Water Works Association), you achieve the same flow rate range of 2.5 gpm suggested in S.583, without jeopardizing the bather to the potential of hot or cold temperature fluctuations. It is these fluctuations which lead to slips and falls in the bathing area, which were conservatively estimated to be 115,000 cases last year (which required hospitalization).

(9) Retrofitting of Devices on Existing Plumbing Systems

Our first point made in this testimony elaborated on the concept that plumbing fixtures and fixture fittings must be married to appropriately sized drainage system in order for the system to function properly. Many of us have had firsthand experience with the hazards of improperly functioning systems. I have always wondered, 'why do sewer and drainline stoppages only occur when we are expecting dinner guests?'

S.583 is written in such finite language that the consumer must bear burden of costs for replacement of existing sewer and drainage piping systems, which are buried below ground, below basement floors, or behind walls if the retrofitted "low consumption" products fail to function on the larger piping systems. I am not implying that this condition will occur with all retrofitted systems and with all fixtures. What I am stating is that the responsible approach would be to permit the manufacturer of water saving products until the drainline studies on new and existing systems have been completed.

(10) Freedom of Choice is Abated

The present selection of water saving products offered to consumers is vast. The selection of low consumption products as defined in the Bill is sporadic. The estimated twenty close-coupled water closets products which have been developed (most over the past twelve month period) constitute less than 3% of the total sales this year. Within two years, the consumer will no longer be able to select specific models which use 3 more than 1.6 gallons of water, but which may afford a better cleansing or a quieter performance.

If I might draw an analogy to the automobile industry - a wide range of products are available which consumes fuel at varying levels. The consumer bears the burden of selecting and paying for the ramifications of his or her selection. The passage of this Bill will negate this courtesy to the purchasers of plumbing products.

Summation. In summation, we recommend against the passage of S.583 or the allocation of funds to support the tasks identified within the Bill. We feel that the Bill fails to address total plumbing system design; fails to recognize the value of the voluntary standards; is wasteful and redundant with codes, standards, and listing concepts presently offered to the public at no cost; and will invite risk to public health and safety by the forcing of water conservation products on systems which have not been designed for such low water use.

Further, we recommend a more open dialogue with the Congressional membership who are interested in the promotion of the provisions within this Bill. We could use your input to support recommended changes in the codes and standards for more advancements in water conservation technologies. We have already recommended your proposals to the appropriate codes and standards agencies.

Finally, I wish to thank your Committee for the opportunity to present my views.

Senator BRYAN. Thank you very much, Mr. Higgins.

Let me direct a question to the panel. I think no one would quarrel with the objective in S. 583. To the extent that we can save water, that it is in our national interest to do so, notwithstanding the region of the country that one may come from.

Would you agree with that as a basic premise, that certainly to save water is a desirable national goal and interest? All right.

Now, my recollection is that as World War Two was winding down, within a period of two years we were able to design, to build and to fly a jet aircraft. What period of time is reasonable for the industry to design a standard which the rest of the country ought to apply?

Mr. HIGGINS. We are in the final balloting process for the standard for the 1.6. It has taken a significant amount of time to address all the issues. But the standard hopefully will be released within the next six months.

We already have a standard for other water-saving products.

Senator BRYAN. So you are saying, Mr. Higgins, so that the record is clear on this hearing, that you would expect within the next six months that a standard would be adopted?

Mr. HIGGINS. The performance standard should be completed by that time. Now, this standard does include all different types of

plumbing products. Our standards are required to be open and fair, and we include every product that is present on the market.

But in terms of a performance requirement for these low consumption products, that is part of the standard. Let me also mention that we have modified all the ANSI standards, including the draft that is about to come out on the water closets and urinals, to require labeling. The labeling will be both on the box and the product, which will assist the consumer, the contractor, and also the inspector to assure that the product is appropriately marked in terms of flow rates, in terms of compliance with the industry standards.

Senator BRYAN. Would the labeling be as expansive as the labeling that is contemplated on this piece of legislation?

Mr. HIGGINS. No, because the labeling in this piece of legislation is far more of a consumer guide type of thing. The contractor and wholesaler select products based upon what is required by the code, and it does not go quite as far. But it does address the two critical points, the flow rate or water consumption and compliance with the industry standard.

Senator BRYAN. Some of you have testified that there are a number of technical problems that the proposed legislation fails to address adequately. You all heard testimony that states representing a population of roughly 40 percent of the entire population of this country have adopted the 1.6 standard.

My question to you manufacturers, those of you who work in apprenticeship programs, those of you who have had 22 years of experience in plumbing: What kind of problems, if any, have been encountered in those states that adopted the 1.6 standard?

Mr. BLISS. Mr. Chairman, I think that the 1.6 standard has been so recently adopted that we do not have the full experience. We do know that there have been drain line stoppages. We do know that, because the product is not always available, there have been many applications for variances, even in Massachusetts or in the Boston area, where the contractor must get a variance in order to install.

Certainly we are not against water conservation. Certainly we are for it. Hopefully, we would like to see a broader scope, and that is why we mention the other bill because as much as 75 percent of the water that we have available to us is being lost through the infrastructure, not wasted by the consumer. These things have to be looked at as well.

Senator BRYAN. Well, I do not understand the proponents of the bill to argue that this is the only water conservation in America that ought to be considered, either at the federal, state, or local government level.

Mr. Bliss, do you agree that the standard that presently exists, the ANSI standard, can be improved from the water conservation perspective, or do you have some reservations about making any changes?

Mr. BLISS. Senator Bryan, I serve on that committee as well. Mr. Higgins is the chairman. I think that the standard that comes out will be adequate to cover it. It does not specifically mandate only the 1.6. The standard includes all fixtures, all water closets, from standard on through the 1.6 or ultra-low-flush.

And yes, I do think that it would be adequate.

Senator BRYAN. Mr. Bliss, let me ask you, because I am not familiar with the standard-setting process, but if hypothetically, without prejudging what your final report will be in 6 months, you conclude that a 1.6 gallon standard is technically feasible, that it is realistic, why not require that standard universally, rather than, if I am understanding you correctly, your assigning standards for various commercial products?

Otherwise, some would have a 1.6 standard, another commercial product that would be sold might have a different standard. The thrust of the legislation is to try to minimize the consumption of water, and I think a lot of us on the subcommittee are sympathetic with the objective.

Some of us are frankly somewhat reluctant to have the federal government get involved in those issues, which have traditionally been the responsibility of local government or voluntary standards. But I must say, I think if you track federal legislation, by and large, it has been enacted when there has been a perception by the Congress of the United States that there has been a failure at the local and state level and occupying that vacuum becomes a matter of federal policy.

And I suggest to you that water conservation has considerable appeal to most of us who serve in this body, and particularly those of us who serve in the West. I do not know if that is too much of a rambling question, but take a stab at it, Mr. Bliss.

Mr. BLISS. Okay. First, I think everybody here is for water conservation. Who could be against it? The thing about the federal legislation that concern us is that the program is more than just standards. After standards, they have to be enacted by a code body. The standards have to be accepted by a code body.

There are three or four national model codes that are accepted around the country. There are many state and local codes that have to adopt those standards. All that is being accomplished as we go through the system.

We have some concern, I have some concern, that we are going to save water just by assuming that we are going from 3.5 to 1.6, that that is a savings in water. We have many instances of double flush. There are many instances where the 1.6 closets that are on the market do not operate.

In Mount Ida College in Massachusetts they had 52 they had to go take back out of a dormitory because they were not properly designed and they were stopping up the drainage system.

My appeal is that, yes, we will get to the 1.6 or whatever the number might be. Let us not start with the number. Let us work toward a number that will give us the most efficient water closet and also provide sanitary conditions.

The amount of water used within a, say, "1.6" can be adjusted. It is not just 1.6. You can go in and adjust it to almost three gallons per flush within the ballcock.

In addition to that, the water pressure that goes to it makes a difference how much water is used. So all of these things have to be taken into consideration when you are trying to determine whether you are making a water savings or not.

Senator BRYAN. Mr. Bliss, suppose the subcommittee—and I do not presume to speak for its members—should buy into the argu-

ment to give you a little bit more time. These standards which have been adopted at the state level apply to—again let us assume the 40 percent of the nation's population is correct. That is a very, very substantial percentage.

It certainly suggests that movement is in that direction. Even for those of us who claim no particular expertise, that is a very persuasive number to work from. And if it is 40 percent this year, one might reasonably assume it will be 50 percent in the very near term, and beyond that in a short period of time thereafter.

What period of time is reasonable for us to make a determination that the 1.6 either works or does not work in practice, as well as in theory?

Mr. BLISS. Mr. Chairman although 40 percent of the population may be covered by this new legislation and that could be so, they are not 40 percent of the water closets installed.

Senator BRYAN. No.

Mr. BLISS. And we do not know the effect of the 1.6 on the systems, and I think that is the major thing we are looking for, is some time to see what happens. How much time? I would think that, with Boston being the leader in this area now, also we have Arizona, several other places that have mandatory legislation—and localities that need it should get it.

I think by within a year we should be able to tell something, or 18 months. The research that the NAPHCC and ASPE are putting together independently will add to that, and that is ongoing now.

Senator BRYAN. So you are saying a year to 18 months. What I am trying to do is to build this record. I do not know what the subcommittee is going to do with this piece of legislation. But I know from having had some experience in public policy formulation that oftentimes delay is a codeword for "let us kill the bill and let us not take any action."

You are telling me that, within a period of a year or 18 months, we should know what kind of problems in fact are encountered. In California, with 28 million people, they are building hundreds of thousands of homes there every year. If the new standard requires the 1.6, we ought to be able to tell, you are indicating to me, in a year, 18 months, what kind of problems, if any.

I do not know that there are going to be any, but we ought to be able to know by a field test of some magnitude in terms of quantity of use.

Mr. BLISS. It would seem so to me, and we should also know whether we actually have any water savings.

Mr. SELOVER. Mr. Chairman.

Senator BRYAN. Yes.

Mr. SELOVER. Just to quickly augment Mr. Bliss' statement. That is part of the beauty of the current system. There is a large amount of impetus coming from the states and municipalities with respect to water conservation in a number of areas. Currently Glendale, Arizona, the city of Los Angeles, and the state of Massachusetts all are requiring 1.6 as of this time, and so those provide a very, very good test bed of the viability of the overall system.

Senator BRYAN. I appreciate that.

Mr. Gants, one question I have to you that may not be totally relevant. You spoke with considerable reverence about the Nation-

al Appliance Energy Conservation Act. My question to you, sir: Did the Association that you represent, testify in support of that legislation when it was being processed by the Congress?

Mr. GANTS. Mr. Chairman, in fact it did and it claims authorship of that piece of legislation. In fact, our law firm was the scribe for that consensus legislation.

Senator BRYAN. A gold star for your credibility, sir.

Mr. GANTS. Thank you.

The point here is, that unlike the National Appliance Energy Conservation Act, the products covered in this bill are covered by local and state codes. That is a big difference.

Senator BRYAN. I understand and I thank you.

I am going to yield my time now to the expert on the subject here, Senator Gorton.

Senator GORTON. Mr. Higgins, the chairman referred at least indirectly to what I am going to ask you. I would like a more precise answer. When you speak of the 1.6 standard for water closets, which you may well adopt within six months or so, is that analogous to what we are talking about in this bill? In this bill there would be a requirement that all water closets after the effective date of the regulations meet that standard. Is not your standard somewhat different? You will come up with a complex standard for a 1.6 water closet for performance and the like, but that does not mean that you will require all water closets to be 1.6 in the future, is that correct?

Mr. HIGGINS. That is correct. Our standard is very all-encompassing. It covers every product that is out there.

Senator GORTON. But anyone who wants to keep on making 3.5's can go ahead and do so?

Mr. HIGGINS. We are required by the Federal Trade Commission to be very open in our discussion of standards. We set performance criteria that they all must pass. In terms of directing specific requirements, that is set forth by the plumbing codes, and there are provisions in at least one plumbing code I know of presently, the national plumbing code, that will be reviewing the requirement of 1.6 in the next six months.

The plumbing codes usually will dictate the requirements, and therefore we write the standard that sets forth the performance. The plumbing codes will dictate what is required for installation. So there is a distinct difference.

By the way, just to confuse the issue a little bit, the standard 1.6 in the ANSI standard is the average, it is not the max, because we permit a higher tolerance up to two gallons per flush at higher pressures.

We have to test these products from 20 to 80 psi, which are typically the low and the high side of pressures within a building. And we do permit a manufacturing tolerance of up to two for the higher pressure systems.

Senator GORTON. One other point which you made in attempting to illustrate some of the differences between this and the energy codes was both an interesting point and in one sense an alarming point. You said that as we created the water infrastructure in the years after World War II and standards, I believe you state, go

back to 1940, they of course reflect the kind of water closets and other fixtures which we had at the time.

And you and Mr. Bliss both said that these 1.6 gallon water closets might very well create considerable problems—you spoke of both intake and outtake, but your emphasis was on outtake—because they would not put enough water through the system to flush it. This might create health problems, drainage problems, and add to expenses.

That is an interesting point. But if the point is correct, are you not telling us that we should not be allowing the use of fixtures which put so little water into an older system that it may not drain appropriately?

Mr. HIGGINS. My point is this. I am very much in favor of a lot of these designs, but I am not in favor of failing to address the marriage of the pipe sizing to the fixture. I think it is totally irresponsible to pass a requirement without looking at the total effects of that system.

Having had the wonderful task of being a plumber and having run electric snakes in my lifetime, which is probably close to the most disgusting task we have to run in the plumbing industry, it is irresponsible not to marry the sizing systems.

Now, the federal government has elected over the years not to fund plumbing research. It is now being done by private industry through the group that was mentioned by Mr. Bliss. I am hoping the results of those reports will be released within the next year, 18 months, 2 years, so that we can take action then.

The industry will go in and say, we think this is appropriate, this is the size of your piping systems, these are the fixture unit ratings or the appropriate fixture unit ratings that are applicable.

This is the way we have been doing it, by the way, for the past 10 years, with no involvement of anyone. We have been testifying at the code hearings for the last 10 years for reduction of water supply, and there has not been anyone standing up there behind me saying: We agree with you, Pat; let us go all the way with it.

So we expect that with the results of that report we will take more than the lead in the plumbing codes to see that this is fulfilled.

Senator GORTON. That is a great answer, but I do not think it was an answer to my question. Let me repeat it once again.

Mr. HIGGINS. Thank you.

Senator GORTON. In the present state of your knowledge, are you telling us that you think it highly inadvisable for Massachusetts or Washington or anyone else even to have had these state or local 1.6 codes, because they have not also required a rebuilding of the infrastructure to reflect them?

Mr. HIGGINS. What I am saying is that I think that the laws should not have been so tight not to evaluate each installation and not to permit variations that would allow the systems to work.

Rhode Island, interestingly enough, the sewer lines that they provide to buildings right now in new homes are 6 inches in diameter, which is roughly twice the size that you absolutely need for the system. So the whole concept of water conservation goes from the individual fixture through the lines in the building all the way out into the street and then on to the sewage treatment plant.

People must start thinking more realistically about marrying everything together. It is much bigger than suggesting a handful of numbers through national legislation.

Mr. BLISS. Mr. Chairman, if I could be heard on that. Yes, the ultra-low-flush toilet should be allowed. No, it should not be mandated at this time.

As an example I believe of what the Senator was asking, probably the most efficient 1.6 gallon water closet right now employs what is called a flushometer tank that expels the water with some air pressure assistance. Pipes are designed, pipeline sizes are designed, on flow rate, not total gallons.

That 1.6 gallon flushes in 3.5 seconds, which is approximately 27.43 gallons per minute. The 3.5 gallon flushes in 12 seconds, which is about 17.5 gallons per minute. You could make a case, if you have not done the research and there is no study there to show yet, that the sizes actually should be larger.

We do not know that for sure, and that is what I think we are asking. Let us, before we mandate the exclusive use of a particular size, do the research and find out that it is not going to have a bad effect on the plumbing system, because once you have bought that house or that consumer has that residence they have it for life. And to go back under ground and under slab to try to replace pipeline seems inappropriate.

Senator GORTON. Thank you.

Senator BRYAN. Let me just ask a follow-up question, and then we will conclude. I believe I understand what Mr. Higgins is talking about, the marriage of the overall system to the actual household appliances to be used. That makes some sense to a layman.

But if indeed, Mr. Bliss, after this six months, year, 18-month period, it is determined that for a new system 1.6 does the job, should we not mandate or at least bifurcate this system? Should we say that all new systems being built, all new construction, as opposed to a replacement part in a preexisting system, that all new systems should have this 1.6?

It seems to me that that would be consistent with the caveat that Mr. Higgins has given us, because in building a new system you would have the integrated concept of whatever the inflow is and the capacity of the system in terms of the outflow.

Respond to that in terms of either the logic or the lack thereof as you find it?

Mr. BLISS. Well, it seems perfectly logical to me. If the system works, if it is accepted by the people and it is used and it is sanitary, there is no reason not to mandate it at that time. I do not think we have that information at this time.

Senator BRYAN. Mr. Higgins, are we off target?

Mr. HIGGINS. No, you are right on target. In fact, what we envision will happen when the research is completed is we will be able to offer to the consumer a down-sized system that will carry the waste more effectively, and we will achieve overall benefits, not only in water conservation but in construction costs.

Senator BRYAN. Gentlemen, we appreciate your time, your thoughtfulness, your expertise, and the candor in which you have responded to our questions.

This will conclude our hearing. The subcommittee will be in recess.

[Whereupon, at 11:38 a.m., the subcommittee was adjourned.]

# ADDITIONAL ARTICLES, LETTERS, AND STATEMENTS [1]

## STATEMENT OF THE MBA RESEARCH GROUP

To: Senate Commerce Committee—Subcommittee on Consumer.
Re: S. 583 National Plumbing Products Efficiency Act of 1989.

MBA Research Group provides securities research to institutional investors on a fee basis. Hence you might question the contribution I can make regarding your deliberations on the subject Bill, since my 29-year career has been in the Securities Industry. I believe I can.

I began an intensive study of the plumbing products industry when I became aware of new standards being placed on water usage by water districts and eventually the State of Massachusetts. My experience has taught me that change creates investment opportunity. Early in my research it became obvious that the major impact from this Bill and similar legislation would fall on the water closet (toilets). My comments and perspectives will address that product primarily.

The plumbing products industry is not large by the standards of many industries in this country. In addition, its primary market (new home construction) is highly cyclical. Its products have evolved without a great deal of differentiation among the various producers. Hence profit margins are narrow which coupled with the cyclical demand leaves the various participants with a rather low return on investment over the long term. In addition, the commodity characteristics of its products leave it open to foreign competition on a price basis.

Industry statistics are at best fragile since they are gleaned from several different sources. However, by my calculation eight U.S. companies account for 90 percent of domestic manufacture or 70 percent of the total U.S. market. The three largest companies have about 60 percent of the market. Only one company (Eljer No. 3) is publicly owned with two-thirds of its revenues from plumbing products. One of the smaller factors is a division of a publicly owned company. Two of the companies including one of the largest (American Standard) recently changed ownership as a result of Leveraged Buyouts. The LBO structure imposes a need on management to maximize cash flow to service the debt, hence long-term R&D type projects are deferred. Private companies without access to public equity capital ("free" long-term capital) also tend to manage from a short-term cash flow perspective.

### CONCLUSION

Business managers, whether private or public companies, measure their success on how they serve the business needs of their enterprise. Change of the type envisioned in this Bill would require an immediate investment by several companies including the two largest which at least would have an uncertain longer-term payoff. It is not difficult for me to see why several companies object to this Bill.

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## STATEMENT OF PAUL F. LEVY, EXECUTIVE DIRECTOR, MASSACHUSETTS WATER RESOURCES AUTHORITY

The Massachusetts Water Resources Authority (MWRA) strongly supports the imposition of national water use efficiency standards for water closets, urinals, showerheads, faucets and other water use products as a significant step in promoting water conservation in the United States. The need for federal legislation is acute. Major water level declines have occurred in every eastern coastal state, partially due to the stress of population growth on the environment. In the arid West, water related problems are even more severe. This bill presents an important policy initiative requiring application of the most efficient technology to reduce the impact of population growth on water resources. It will help foster an understanding of water as a

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[1] The Committee requested additional comments from the Department of Commerce and the Environmental Protection Agency; as of press time, February 23, 1990, none were received.

precious, endangered resource and will reduce the use of expensive and inefficient technologies that increase water consumption without any discernable benefit to the user.

The bill mandates a comprehensive plan to conserve water by requiring national standards, testing procedures and "water use guide" labeling for water-efficient plumbing fixtures. Although some states, including Massachusetts, have revised their plumbing code to require the installation of water-efficient fixtures within the state, national standards are still urgently needed. National standards which reinforce local initiatives, such as those in Massachusetts, will encourage compliance and make local initiatives more effective, as they will be seen as part of a national program. National standards will also facilitate interstate marketing of water-efficient products and help to avoid piecemeal legislation in this area. The establishment of national standards will improve water conservation in those states which, as yet, have not set standards for water-efficient plumbing fixtures or where the standards do not reflect state-of-the-art technology. The development of nationwide mandatory test procedures for these products will aid in preventing false and misleading advertising.

Recent developments in Massachusetts illustrate how simple technological changes, like those contemplated by this bill, can lead to significant water savings, even if people do not change their water habits. On March 2, 1989, a major plumbing code change took effect in Massachusetts. The code change switched the standard for new toilets installed in the Commonwealth from the 3.5 gallons per flush (gpf) "water saver" model to the 1.6 gpf "low-flow" model. The Massachusetts Plumbing Board estimated that households which install the new low-flow models will save between 10,000 to 25,000 gallons of water annually. Consumers stand to realize substantial rate savings through the use of low-flow models. This plumbing code change alone is expected to save over 3 million gallons of water per day by the end of 1990.

To stimulate a smooth and rapid changeover to more efficient fixtures, the MWRA launched a program to replace approximately 2500 toilets in municipal buildings within its service area. Under this program, the MWRA is purchasing and arranging for the delivery of the toilets to participating municipalities. The municipalities are responsible for proper installation of the new toilets and disposal of the old ones. The municipalities are also being asked to provide water-usage data for the buildings chosen for retrofit and to assist in making the general public aware of low-flow toilets. To date, 21 of the 43 eligible communities have applied to participate in this program. The primary aim of the program is to increase general awareness about the effectiveness and reliability of low-flow models as well as the significant water saving advantages to be gained through their use.

In addition to its Municipal Toilet Replacement program, the MWRA also launched Operation Watersense, a pilot retrofit program to test the feasibility and effectiveness of water-saving fixtures and appliances in residential buildings. Under Operation Watersense, the MWRA targeted 15,000 households within the MWRA's service area to receive low-flow showerheads, faucet aerators, toilet displacement fixtures and a household leak detection survey. The households were preselected to represent an appropriate mix of housing, water use and economic characteristics in the MWRA service area and included a broad cross section of old and new housing stock and water use in urban and suburban settings. The MWRA anticipates that these households will experience substantial savings in gallons of water used as well as dollar savings. While the typical showerhead uses up to 7 gallons of water per minute, low-flow models use only 1 to 3 gallons per minute. This can save 20 to 40 gallons during one ten minute shower, a savings of over 7,000 gallons of water per year. Similarly, the low flow toilets use only 1.6 gallons of water per flush as compared to the 3.5 to 7.0 gallons currently used by conventional models. These products save time and money, and they are just as effective as the higher consumption models.

The "energy use guide label" prominently affixed to household appliances has been a useful tool in educating the public to the need for energy conservation. This concept is readily adaptable for use on water-conservation devices and, once implemented, should effectively educate the public to the need for water conservation as well as the potential savings to be gained from purchasing water-efficient plumbing fixtures.

In conclusion, the MWRA supports the imposition of national water use efficiency standards and "water use guide" labeling for water use products. Water is becoming a significant expense for business, industry and households. As a nation, we are experiencing an increasing need conserve water and to educate the public on the ways to do so. However, as the MWRA's experience will attest, changing people's water

use habits is very difficult. Persuading people to take shorter showers or shut off the faucet as they brush their teeth can be an uphill battle. In contrast, the use of water efficient products meeting national performance standards would save water automatically. Once installed, a fixture just keeps on saving water without requiring a change in individual water habits. A nation-wide initiative, such as this legislation, is critically needed to halt the installation and use of water-wasting products and replace these with state-of-the-art water-conservation fixtures.

While the MWRA fully supports the proposed legislation, we offer a further point for your consideration. There is one area that is not covered by the proposed legislation that the MWRA feels the committee should consider including in S. 583/H.R. 1185. Plumbing fixtures have been identified as sources of contaminants in drinking water. For example, brass water fixtures may contribute a substantial amount of lead to drinking water consumed by the American public. EPA has been considering ways to control or eliminate lead in public drinking water supplies but does not have the power to remove or eliminate plumbing fixtures in the control of private parties. Setting standards for such fixtures aimed at reducing or preventing discharge of contaminants of concern into drinking water would be an effective means of complementing EPA's efforts. More importantly, such provisions may be the only effective means for controlling lead contamination to the degree required for public health.

Thank you for the opportunity to comment on this legislation.

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STATEMENT OF JERRY JORDAN, EXECUTIVE DIRECTOR, CALIFORNIA MUNICIPAL UTILITIES ASSOCIATION

I am Jerry Jordan, Executive Director of the California Municipal Utilities Association. Our association represents publicly owned electric, gas, and water utilities from throughout the State of California. They range in size from the City of Gridley with just over 4,000 population to the City of Los Angeles serving over 3,000,000 and the Metropolitan Water District of Southern California which provides water to over 14,000,000.

The provisions contained in S. 583, the National Plumbing Products Efficiency Act authored by Senator Fowler are important steps in increasing both water and energy efficiency without the necessity of changing lifestyles.

Approximately 40% of domestic indoor water use is toilet flushing. In addition vast amounts of energy are used to pump water from groundwater aquifers and to treat the unnecessarily large amount of sewer effluent. S. 583 offers vast energy and water savings at little or no cost to the customers of water and energy utilities.

California and other areas of the country are finding it increasingly difficult to provide water to meet the growing population demands and to meet the growing environmental concerns. In addition California, as many other states, have suffered recent droughts and some areas of California experience water shortages in any year. Measures such as those contained in S. 583, which conserve water without changing lifestyles, are extremely important to meeting the ever increasing demand on a water supply system which is not increasing.

The marketplace can not be relied upon to promote water conserving toilets because most often the individual making the decision about which toilet to install is not the person who will pay the water bill. Most plumbing fixtures are ordered by the person constructing the building not by the ultimate resident. There is a distinct need for federal standards to be set to protect the consumer and to insure that water is not wasted needlessly. This is particularly important for rental property where the water and energy bills are paid by the tenant.

Field tests have shown that in all respects toilets utilizing 1.6 gallons or less perform as well or better than current toilets which use up to 3.5 gallons per flush. The toilets are also in the same price range as conventional toilets. Such fixtures have been sold in the United States for over ten years and the California Department of Housing has approved five brands for sale in California already. Toilets using 1.6 gallons or less have been required by ordinance in the Goleta Water District (Southern California) since 1983 where nearly ten thousand have already been installed with very high customer satisfaction.

The Governor of California has just signed legislation sponsored by the California Municipal Utilities Association which would require all buildings constructed in California after January 1, 1992 to use toilets consuming less than 1.6 gallons per flush. Such a requirement is also law in the states of Massachusetts, New York, and Washington.

We believe it is important to pass federal legislation to standardize the requirements nation wide. As stated earlier, the marketplace is not likely to increase the efficiency of toilets without federal regulation because the customer who purchases the toilet is not usually the person who pays the water and energy bills. Builders are more concerned with color schemes than with the efficiency of the plumbing fixtures.

The normal test for water rights decisions is the reasonableness of use of the water. It is an unreasonable use to continue using 3.5 gallons to do a job which can be done as well or better with 1.6 gallons or less. We urge you to give your favorable consideration to S. 583. It is much needed and much overdue legislation.

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## Statement of the Maytag Corp.

Maytag Corporation is a leading manufacturer and marketer of a broad line of residential kitchen and laundry appliances. These products include such brands names as Admiral, Hardwick, Jenn-Air, Magic Chef, Maytag, and Norge.

The National Plumbing Products Efficiency Act of 1989 (S. 583) would establish federal water usage standards and labeling requirements for certain products including residential dishwashers and clothes washers. Under this bill, the Secretary of Energy would set maximum water usage standards (in gallons per wash) for dishwashers and clothes washers, effective January 1, 1992. In addition, S. 583 requires the Federal Trade Commission to prescribe labeling rules similar to existing energy labeling rules administered by the FTC.

Maytag Corporation supports national policies that encourage both energy and water conservation and believes that its products contribute to these important objectives. However, the proposed legislation's imposition of water-using standards and labeling requirements on dishwashers and clothes washers does not take into account the state of existing technology and would work to the ultimate disadvantage of consumers.

### WATER USAGE STANDARDS

In regard to the bill's proposed water usage standards, Maytag dishwashers and automatic washers are already highly efficient water users. Given the state of existing technology, significant water usage improvements are not foreseeable. Further, it is important to note that an adequate supply of water is crucial to the performance of these two appliances. Consumers will not be well-served if regulations are imposed that seriously compromise the ability of these products to perform their tasks. The following information describes the operation of these two products from a water-using perspective.

### AUTOMATIC WASHERS

The Maytag top loading automatic washer has a solid outer basket that contains the wash water. An inner basket which is perforated, contains the clothes to be washed. An agitator, located in the center, oscillates back and forth, moving the water in a toroidal pattern up the outer sides and down the center of the tub. This causes the clothes load to circulate, mixing with the wash solution for proper cleaning. Loading the inner basket loosely with clothes to the top will result in proper clothes circulation and cleaning at the maximum water fill. All Maytag washers have a water level adjustment so if smaller loads are placed in the inner basket, the wash level can be adjusted to match the wash load. Water efficiency in a top loading automatic washer can be optimized by minimizing the space between the inner and outer tub (unusable wash space). A small space of approximately ½" is the minimum space that will allow manufacturing tolerances needed for the relative movement between the stationary outer tub and the spinning inner tub.

Maytag does offer sud-saver models of washers which allow the user to save the wash water and re-use it for subsequent loads. This does reduce total water use by approximately 25% if three loads are done in succession to take advantage of the water savings.

Front-load tumble washers offer only minor savings in total water use (about 5–10 percent) and have certain shortcomings that affect energy use, design complexity, and consumer convenience. Tumble washers do not extract as well as top loading washers so clothes dryers must use more energy to dry a load. Also, because of the horizontal tumble action of a front load washer, the spin portion of the cycle is complicated by the need to distribute the wet items prior to spin for proper balance.

This can result in a more complicated suspension system. Finally, the consumer must repeatedly bend over to load and unload a front-load washer.

DISHWASHERS

The Maytag dishwasher design utilizes a filter system that results in efficient use of water and yet allows the use of small, high velocity jets of water which result in excellent cleaning. The filter screen has square openings that are .016÷÷ on a side and filters 100 percent of the water being recirculated. This system requires maintenance of a certain "head" in the dishwasher bottom to prevent "starving" the pump during circulation. The minimum amount of water per fill is thereby specified to achieve the proper performance of the filter system.

The number of fills for a minimum cycle is three—one wash and two rinses. The maximum cleaning cycle has five fills: two washes and three rinses. The consumer can select the proper cycle to achieve proper cleaning of each specific dish load. The total water used per cycle then would vary from about 9½ gallons up to 14 gallons for our maximum cycle. An Ohio State University study indicates that hand dish washing uses an average 15.7 gallons of water to wash the equivalent of a full load in a dishwasher. According to this study, a Maytag dishwasher on its highest water use cycle uses water more efficiently than dish washing by hand.

LABELING

It is important to note that both dishwashers and clothes washers are already covered by the Federal Trade Commission's appliance energy labeling rule. The estimated annual yearly energy cost of operating these appliances must be stated on a label attached to the front of these products. Over 80 percent of the energy used by a Maytag dishwasher is attributable to the hot water it uses, while more than 90 percent of the energy used by a Maytag clothes washer is attributable to the hot water it uses. Since the dishwasher uses only hot water (the appliance is only hooked up to the hot water line) the energy label is a direct indicator of the total water use of that product. Similarly, in clothes washers the hot water usage reflects a substantial portion (25–30 percent) of the total water use so the energy label is also a good indicator of its total water usage.

On hot water-using appliances, the existing federal test protocol and labeling requirements already reflect energy use and are indicators of the water use of these appliances. Maytag believes that additional labels would be redundant and would only confuse consumers who already have the capability, through the existing FTC energy labeling program, of choosing lower energy and lower water-using models. In addition, Maytag provides information to purchasers of these appliances that is designed to promote water-saving practices (examples of this information are attached to this statement).

To summarize, Maytag does not believe that water usage standards for dishwashers and clothes washers are either feasible or necessary. Further, since existing energy labels provide consumers with a basis for comparing water usage, it would be counterproductive to require yet another label. Maytag therefore recommends that Title II, "Water Use Standards for Automatic Dishwashers and Clothes Washers", be removed from S. 583. In addition, Maytag recommends that dishwashers and clothes washers be specifically exempted from the labeling provisions of this legislation.

Thank you for this opportunity to present Maytag's views.

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STATEMENT OF DAVID J. FOX, ON BEHALF OF THE NATIONAL ASSOCIATION OF PLUMBING-HEATING-COOLING CONTRACTORS

My purpose today is to address S. 583, the National Plumbing Products Efficiency Act, on behalf of the National Association of Plumbing-Heating-Cooling Contractors (NAPHCC). NAPHCC is the oldest and largest association in the mechanical trades, representing over 6,000 member firms with 140,000 employees nationwide. I will take this opportunity to discuss why a majority in the plumbing industry feel that this legislation is not in the best interest of the industry or the public that it serves.

NAPHCC was organized more than 100 years ago, when a group of businessmen-plumbers met in New York city with a shared idea that the public's interest in health and sanitation demanded a high degree of integrity within the plumbing industry. These early master plumbers' public concern carries on today, and of course we are concerned with making America's plumbing system as water-efficient as possible while maintaining its high sanitary standards.

The plumbing contractors who comprise NAPHCC's membership have perhaps the broadest involvement with this issue of any in the industry, as they must deal with labor, suppliers, manufacturers, code writing bodies and, most importantly, consumers. Contractors are the most public members of the distribution chain, being the first to hear from aggravated customers.

Senator Fowler's concern about the nation's water shortage is admirable, and we are in complete agreement that the plumbing industry should be responsive to the situation. However, it is NAPHCC's position—one shared by the majority in the industry—that we are responsive to the water crisis and a national standard requiring the use of ultra-low-flow (ULF) plumbing fixtures is premature and unnecessary. The primary area of concern is the requirement for 1.6 gallon-per-flush water closets.

A toilet is part of a coordinated plumbing system, which takes into account the size of the pipes, the angle at which they are placed, the distance that one flush must carry waste, and, of course the amount of water in the flush. Obviously, when the amount of water is cut by more than half, there is cause for concern that waste may not be adequately removed from the system. Evidence on this issue is limited and conflicting. Research has been narrow in that it related to specific products, or was conducted under ideal laboratory conditions that simulated the most modern plumbing systems.

Early this year NAPHCC informally surveyed some 2000 of its members to see what contractors with experience installing and servicing ULV toilets had to say about them. We found that there were higher incidents of problems than usual. Nearly half of those respondents reported that it took two or more flushes to adequately clear the bowl, obviously negating the supposed water savings. There were more customer complaints than usual, and increased problems with stoppages. We don't mean to present this survey as scientific research. We do, however, feel it does serve as an indicator that ULF toilets may not be suitable under all conditions. Therefore, we feel a national standard requiring ULF toilets is ill-advised at the present time. Further research is needed to determine why ULV water closets work without a hitch in certain situations and cause problems in others.

In this connection, The National Association of Plumbing-Heating-Cooling Contractors Educational Foundation, in conjunction with the American Society of Plumbing Engineers Research Foundation, is working with an independent research laboratory to conduct the necessary research. The research will be targeted to answer the following questions: 1) which of currently available water closets effectively flush solids an adequate distance to avoid buildup?; 2) Should branch drain sizing required by major national plumbing codes be reduced, and how will ULV toilets work with older drainage systems designed for larger-capacity fixtures? 3) How will ULV water closets affect aging Drainage Waste and Vent (DWV) systems. 4) Can vent sizing required by major national codes be reduced? 5) To what extent will bowl staining become a factor due to low flow flushing? 6) What will the effect of low flow flush be on pipe grading?

Another problem with this legislation is that it doesn't take into account the personal habits of consumers. Obviously, if someone is filling a bathtub, a ULV faucet will only make the process take longer. If someone is used to a high-pressure shower, they will likely feel the need to spend longer in one with greatly reduced flow. If additional flushing is necessary to properly clear the bowl, this will negate any water savings.

Another facet of the proposal which needs to be addressed is that which gives the Secretary of Commerce discretionary powers over the plumbing industry, with the power to tighten, but not relax, efficiency standards. This provision gives someone with little knowledge of the plumbing industry considerable authority over those for whom it is a livelihood. And, I might add, this is an industry which, operating on its own without federal involvement, has given the U.S. the world's finest plumbing system, and, more to the point here, has indeed been responsive to the nation's water crises.

It becomes necessary at this point to address the subject of the plumbing industry's model codes, since it is through this process that the industry is responding to the nation's water shortage.

The plumbing industry chain of operation is from manufacturers, to suppliers, to contractors, and on to the consumer. Engineers provide the technical design for the job, and of course the union represents labor. All of these groups are affected by plumbing code changes, so all are concerned and have input into the process. The American National Standards Institute is one of the primary organizations which sets standards for specific products, and Inspectors are the officials which do the

actual police work, by inspecting the installation to ensure that it complies with the performance requirement of the locally adopted plumbing code.

Plumbing Codes set performance requirements, and are designed to protect the health of the public. They specify, for example, what pipe size is required to remove a certain amount of sewage or supply potable water, how sewer gases are to be adequately vented, and how piping is designed and installed so the system can be effectively maintained with maximum health protection.

There are several major national plumbing codes, among them National Standard, Building Officials and Code Administrators, Southern, and International Association of Plumbing and Mechanical Officials. A plumbing code becomes binding when it is adopted as statute by a city, county or state. State or local governments sometimes adopt a customized code which is based on one of the major codes, and most areas of the country are covered by some form of plumbing code.

I will use National Standard Plumbing Code (NSPC) as an illustration, as NAPHCC sponsors this code. The sponsor of a code handles the administrative requirements for its maintenance and alteration, and acts as secretary for a committee of experts that decides what changes are made. The NSPC Committee consists of contractors, engineers, inspectors and labor representatives. Anyone can offer code changes to the committee, which considers and then votes on them. The NSPC Committee holds a yearly hearing in various parts of the country, where industry experts testify on proposed changes.

In the interest of water conservation, the four major codes now require the 3.5 gallon per flush (gpf) "water saver" toilet, which has been the standard in most parts of the country for about ten years. The standard prior to this was 5–7 gpf. Also, a code change request has been recommended to the NSPC Committee to require 1.6 gpf water closets in new construction and replacements. Also, the American National Standards Institute (ANSI) Committee A112 is revising current performance requirements in the national standard to require 1.6 gpf water closets. As you can see, the ULV issue is already under discussion within the industry.

Through the system of model codes, the plumbing industry is responsive to the public's interest in efficient water use, while leaving state and local governments the flexibility to adopt whichever code is best suited to their own needs and conditions.

Another thing I would like to point out is the relatively small amount of water this legislation would affect. According to a Congressional Research Service report entitled "Water Conservation: Options for the Residential Sector", water for domestic purposes accounts for 7 percent of fresh water withdrawals in the United States. Landscape irrigation, or lawn watering, accounts for 46 percent of water that goes for residential use. Estimates of the amount of water this legislation will save fail to take into account the fact that, since it affects only new construction and replacements, it would be many years before full savings could be realized. I fail to understand why the nation's plumbing system, which uses relatively little water, should be singled out for conservation when most of the water used, and none too efficiently I might add, is in the agricultural sector. Wouldn't it make more sense to look at irrigation methods as a means of saving water? NAPHCC favors an approach such as that taken by Senator Fowler's other water conservation proposal, the "Municipal and Industrial Water Conservation Act". This proposal seems to us like a much more realistic and effective approach to the nation's water crisis.

I hope that this testimony has clarified and explained why NAPHCC, and others in the plumbing industry feel that it is premature and unnecessary to set a national standard requiring the use of ULV plumbing fixtures. We certainly recognize the need to conserve water, and plumbing contractors are proud of our industry's tradition of concern for the public's well-being. I would not want to leave the impression that in opposing enactment of this legislation, we are opposed to the development of ULV technology. On the contrary, most in the industry see widespread use of these fixtures in the future. But we differ with Senator Fowler's approach to this because we feel that, at this stage in its development, it would be a mistake for Congress to set a national standard to implement it. Left to its own, the industry will bring this about through its model codes, and state and local ordinances. A number of states have recently passed laws requiring the ULV fixtures in the future. However, these are too recent to gauge their effect or what sort of problems will be encountered.

I would like to thank Chairman Bryan for the opportunity to address the Subcommittee on this issue, and also for taking the time to meet with several Nevada PHCC members in July and listening to our concerns about this bill. I will close with the NAPHCC's motto, "The plumber protects the health of the nation."

Thank you.

STATEMENT OF THE MECHANICAL CONTRACTORS ASSOCIATION OF AMERICA

The Mechanical Contractors Association of America (MCAA) appreciates the opportunity to present our comments on S. 583, the National Plumbing Products Efficiency Act.

MCAA is a construction trade association of approximately 1,300 firms employing approximately 125,000 persons. The work of a mechanical contractor is used to move fluids—both liquids and gas. This includes the fabrication and installation of heating, ventilating, air conditioning, process piping and plumbing systems, and further encompasses service, maintenance and the testing, adjusting and balancing of these systems. Our work effects multiresidential, commercial, public and industrial facilities. According to our 1987 membership profile approximately 75 percent of our members perform plumbing work.

MCAA co-sponsors [with the National Association of Plumbing-Heating-Cooling Contractors (NAPHCC)] the A40 Accredited Standards committee that is developing a national consensus plumbing code under the auspices of the American National Standards Institute (ANSI).

With regard to S. 583, MCAA strongly endorses the motivation behind this bill for water conservation. As our nation's population and water use expand, the need for an adequate supply for all water consumers is essential, and the earlier that the issue is properly addressed the better. In the interest of national water conservation overall, MCAA believes that S. 583 is too narrow and too restrictive, as outlined in the following paragraphs.

1. The scope of the bill is too limited, in that it provides for water conservation in plumbing systems and plumbing products while not addressing conservation for the largest consumers such as the agricultural sector. The narrow application of S. 583 will affect only a relatively small portion of the nation's total water supply and use and, at best can have only a minor impact on the total water supply problem.

If legislation is to be effective—and fair—in regulating water availability and consumption, it must apply to all consumers, not merely a small percentage. MCAA urges strongly that any national legislation apply to the total supply and consumption of water in the United States, rather than target only certain segments.

2. One of the principal requirements of S. 583 is the mandatory use of ultra-low-flow (ULF) plumbing fixtures, including a requirement for 1.6 gallon-per-flush (GPF) toilets.

The 1.6 GPF water closets are relatively new and at this time have not been installed in substantial numbers in buildings and residences across the nation. Reports on the effectiveness of these toilets are not sufficiently conclusive (or perhaps accurate) enough to prove how satisfactorily they operate, for example, in disposal of waste in a single flush.

Perhaps a greater concern is the effect that the low water volume systems may have on sewage disposal systems. The existing sewage systems have been sized and configured based on anticipated amounts of liquid flow. A consistently sizeable reduction of water in these systems may result in inadequate removal of the waste matter that must flow to the waste water treatment or disposal facilities. In essence, the nation in attempting to solve one problem, may create another one.

To illustrate this latter point we need to look only at some results of the national emphasis on energy conservation. During the 1970's we added large amounts of insulation, caulked and sealed building exteriors and reduced the amounts of outside air induced in order to make our buildings more energy efficient. In many cases these measures succeeded. However, in the 1980's we are now concerned over the so called "sick building syndrome" and low quality of indoor air which are, in part, related to some of the energy conservation measures that have reduced the amounts of outside air brought into buildings.

In order to reduce the possibility of creating new problems while trying to solve others related to water consumption, MCAA urges that the extensive use of low flow fixtures and their effect on existing sewage disposal systems be researched scientifically before requirements as contained in S. 583 are imposed. Research now may help avoid difficulties in the future.

3. In the area of administration S. 583 provides broad power for the Secretary of Commerce to set water use performance standards for plumbing products through the creation and staffing of a new agency. Quite frankly, MCAA does not believe a new agency should be created to regulate water use for a narrow segment of water use and consumption while the agency has no regulatory power over other areas that have much greater water consumption.

In establishing the new office, S. 583 does not provide for a source of personnel spaces or the necessary funds to support it. We recognize that such provisions are

not a requirement in legislation. However, MCAA as an organization whose members are seriously concerned over the expansion of the federal government and the continuing huge federal deficit spending, believes that it is appropriate for bills that require personnel and increased expenditures address the resources and their impact on our government. We would hope that any new offices and agencies created would, in large measure if not totally, be staffed without increase in current personnel levels and within funding limits that will be a part of a concerted Administration and Congressional program reducing the federal deficit.

Finally, no additional governmental agency is needed to regulate the plumbing industry. It is already regulated. A wide range of national consensus standards have been developed on plumbing and plumbing products under auspices of such organizations as the American National Standards Institute and the American Society of Mechanical Engineers. The consensus process is stringent and requires participation by a cross-section of installers, manufacturers, designers and users. They cover technical criteria for products as well as water conservation measures. Such standards, plus model codes developed by the industry are incorporated by various states and local jurisdictions in their plumbing codes and as such, carry the weight of law.

In summary, MCAA strongly endorses the concept that the United States needs to take measures that will conserve our nation's water supply. We believe that S. 583, while being one approach to water conservation is too limited in its scope to make a significant impact on total water consumption and use. We also believe that the use of low-flow waste fixtures should be researched carefully before being mandated by national legislation. Finally, any office created to oversee and regulate water conservation should have authority over all sectors that consume water and be staffed and funded under a budget deficit reduction program.

We appreciate the opportunity to present comments on this important legislation and will be pleased to discuss our views in more detail with members of the Congressional staffs.

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## Statement of the American Water Works Association

### INTRODUCTION

The American Water Works Association (AWWA) is an international, non-profit, scientific and educational society that represents water supply professionals and organizations. Founded 108 years ago, the association has over 48,000 members that include operators, managers, engineers, environmentalists, scientists, water supply regulators, academicians, manufacturers, and others who hold a genuine interest in water supply and public health. The AWWA membership includes roughly 3,200 water utilities that supply about 70 percent of the nation's drinking water.

The AWWA has a vital interest in water conservation and the establishment of water use efficiency standards. A growing number of AWWA's member utilities face periodic or chronic water shortages and many have active water conservation programs. Most of the domestic water conservation strategies developed to date have been pioneered by AWWA members.

Commitment to efficient use of existing water supplies is becoming increasingly important. Increasing demands on limited high quality water sources and persistent or recurring drought conditions in many regions of the United States demands that water supplies be used wisely and efficiently. In every year of this decade, some region of the United States has experienced a drought-related crisis.

The conservation of water is insurance for future prosperity and continued growth because it helps balance supply with demand. Establishing maximum water use standards for plumbing fixtures (toilets, showerheads and faucets) is one of the most effective ways to improve water use efficiency in the home. Every new home or building equipped with water efficient plumbing fixtures can, by reducing its water and wastewater loads, provide additional water supply and wastewater capacity to help sustain future economic development and also significant in-stream uses such as recreation and fisheries.

### GENERAL COMMENTS ON PROPOSED SENATE BILL 583

The AWWA believes that the long term benefits of water demand management through water conservation balanced with traditional source water development is the preferred management tool for water utilities to meet future drinking water demands. The use of water efficient plumbing fixtures is an effective, direct means of reducing water demand in the home. The AWWA supports the establishment of national water efficiency standards for new plumbing fixtures and appliances as an

essential component of water conservation practice. The AWWA is pleased to offer the following comments in support of proposed Senate bill 583.

The estimated water savings to a typical household from the use of water efficient toilets, showerheads, and faucets can be considerable, depending on the flow rate of currently installed fixtures. For example, estimates have shown that by using a water efficient 1.6 gallons per flush (gpf) toilet, rather than the conventional 3.5, 5.0, or 7.0 gpf toilet, a 54 to 77 percent savings in water use for toilets can be achieved. In the case of showerheads, a 50 to 61 percent savings in water use for showers have been estimated by use of water efficient fixtures.

The AWWA encourages conversion of existing high water use plumbing fixtures to more efficient designs. Many water utilities already encourage consumers to convert to water efficient plumbing fixtures through retro-fit or rebate programs for existing and new construction. The AWWA believes that a phased conversion of existing fixtures should be implemented through voluntary replacement programs, and is opposed to mandatory retrofitting. Mandatory use of water efficient fixtures for new construction or renovations, however, is appropriate.

### SPECIFIC COMMENTS ON PROPOSED SENATE BILL 583

Section 103, Part a, of proposed Senate bill 583 directs the Secretary of the Department of Commerce to prescribe water use standards for each covered product to achieve maximum efficiency of water use technologically feasible and economically justified. Part b of Section 103 states specific maximum water use standards for certain plumbing products. The AWWA believes that the maximum water use standards specified in Section 103, Part b, are achievable although consideration should be given to increasing the showerhead standard to achieve better compatibility with some existing state legislation. Fixtures meeting the stated standards are now commercially available throughout most of the United States. We recommend, however, that consideration be given to allowing the establishment of the maximum water use standards for all fixtures through the regulatory process established in Section 103, Parts c through f, rather than including them in the bill. The AWWA believes that allowing input by the public and the regulated industries, through the regulatory process, on what the maximum upper limit should be for each fixture, would strengthen the legislation.

Section 104 of proposed Senate bill 583 has an important consumer education component that would require plumbing fixture marking and labeling requirements modeled after the federal "Energy Use Guide" label that is required on all electrical appliances. The AWWA supports this effort to provide information in order to better guide the public on the water demands and costs associated with plumbing products, thereby stimulating efficient practices.

Section 106 establishes a national water use database to more accurately track the nation's water demands and needs, particularly as they relate to the use of plumbing fixtures and appliances. This information would be of great use to water supply professionals who must estimate the benefit/cost relationship of implementing water conservation programs.

Section 111 establishes that a water use efficiency standard, procedure, or rule under this bill will supersede any state regulation or river basin regulation. Some State and local governments have already passed laws or codes to establish maximum water use efficiency standards for plumbing fixtures. For example, Massachusetts set a national water conservation precedent in 1988 by amending its state plumbing code to require the use of low volume toilets that use a maximum of 1.6 gpf. Rhode Island, Connecticut, New York, and Washington, as well as California have followed Massachusetts' lead by enacting laws or codes to require the use of 1.6 gpf toilets. Proposed Senate bill 583 would serve to bring uniformity to water use efficiency standards across the United States.

Section 112 establishes an advisory committee that will report annually to Congress on the implementation of Title I of the bill. The AWWA supports this committee concept and as a leader in the drinking water industry, requests a standing appointment to the committee.

### RELATED BENEFITS OF PLUMBING EFFICIENCY STANDARDS

As with all water conservation measures, the water and related cost savings potential from the installation of low volume plumbing fixtures can be far-reaching and profound. Such savings accrue not only to the direct user in the form of reduced water and sewer bills, but to the water supply and wastewater system as a whole. In evaluating the potential savings from proposed Senate bill 583, the benefits on the other side of the equation—to the wastewater system and related costs—should also

be assessed. The impact of water conservation extends much farther than the tap; a host of infrastructure, natural resource, and related cost benefits will also occur.

Reduced water demand results in reduced water supply needs may result in deferral of associated capital investment and operating costs for the infrastructure that is necessary to maintain and expand existing facilities or provide new supplies. Similarly for the wastewater treatment and collection system, reduced water demand automatically reduces corresponding wastewater volumes and the associated energy, chemical, material resources, and related economic costs for its collection and treatment. Future water supply and wastewater treatment facilities could be downsized once per capita demand has been permanently lowered. Reduced volumes of water and wastewater would also result in less wear and tear on system facilities, thereby prolonging the value and life of the system and its infrastructure. Such cost savings could be better utilized to help stabilize utility costs and upgrade existing facilities. Reduced volumes of water and wastewater will result in lessening of adverse environmental impacts associated with the withdrawal of ground and surface waters for consumptive use and the discharge of treated effluents to receiving waters.

SUMMARY

The potential benefits of national water use efficiency standards for plumbing fixtures are significant. Unlike some environmental problems that require complex technological changes and innovations for solutions, the conservation of water supplies can often be easily accomplished through direct methods of demand reduction. Establishment of national water use efficiency standards for plumbing fixtures is a crucial first step toward that end.

Water supplies of the future will be directly impacted by the decisions made today concerning water use efficiency standards for plumbing products. AWWA is vitally interested in proposed Senate bill 583 and is committed to supporting and assisting efforts to establish national legislation and standards.

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STATEMENT OF THE AMERICAN SOCIETY OF PLUMBING ENGINEERS

The American Society of Plumbing Engineers (ASPE) is the national professional organization of 6,500 engineers and related design professionals involved in the design and specification of plumbing systems in commercial, residential, industrial, and institutional buildings throughout the United States and abroad. As such, we offer our comments on the technical aspect of the bill before your committee, Senate Bill 583, the National Plumbing Products Efficiency Act of 1989, introduced by Senator Fowler of Georgia.

First of all let us emphasize that this Society does *not* oppose the goals of this bill; to the contrary, ASPE endorses and supports efforts to effectively and efficiently conserve water. We have found that questioning any segment of this particular bill has placed the questioner in the position of appearing to oppose water conservation, which is somewhat like questioning apple pie and motherhood, and we wish to stress at this point that ASPE is fully behind efforts to generate and promote water conservation, recognizing that this issue will quite likely be the paramount national concern of the United States in the foreseeable future.

While we question one specific section of the bill—that limiting water closets to 1.6 gallons-per-flush (GPF) or less—ASPE does *not* oppose the 1.6 GPF water closet itself, many models of which have been tested and were found to perform satisfactorily. Nor does ASPE question the use of these fixtures in many applications, most notably in one- and two-family residential installations. Indeed, with the legislation enacted in many states and municipalities recently, the effectiveness of these fixtures has been amply demonstrated in many applications. However, this bill would *universally* mandate the use of these 1.6 GPF water closets in each and every installation, commercial as well as residential, retrofit as well as new construction. And that universal aspect is where we raise our question.

We are questioning one specific aspect of this bill. However, in the larger sense we also question the underlying rationale of the bill. This is presented as product performance standards legislation, and it is. However, the products being addressed are generally part of the overall plumbing system, with significant impact on the drainage and waste systems as well as the water supply system. By addressing the specific products alone and failing to address the systems with which the products interact, this bill does not appear to meet the requirements of responsibility that national legislation would normally involve.

A water closet is an integral operating component of a larger system, including both the water supply piping—the water inflow—and the sanitary drainage system—the outflow. The water closet impacts directly on both "sides", lowering the amount of water required of the water supply system—the goal of this bill—but at the same time impacting the sanitary drainage system by reducing the amount of water being flushed down the system, lowering the amount of water carrying off the sewage material. There have been indications that in some specific situations, notably those with an extended horizontal branch drain, that a reduction to 1.6 gallons of water (or less) in the flush will fail to remove the sewage materials from the drain line, creating a stoppage in the line. (It is true that such a situation would not comprise a majority of the situations in which the 1.6 GPF water closets would be used, but it would include a significant portion, far more than an "insignificant few.")

Should such a stoppage occur, it could pose a serious health hazard, as the stoppage material would be an ideal breeding ground for bacteria and viruses. The resulting backup and overflow would expose the public to an unhealthy, unsanitary condition.

ASPE feels that the inclusion of the 1.6 GPF in the universal mandate should not be done without careful consideration of the total impact on the integrated plumbing systems of which these units are a part. As mentioned, in certain specific situations the low-flow nature of the discharge of the 1.6 GPF water closets is such that it will not adequately clear the drain line, and to date there has been no comprehensive research or analysis relative to the specific situation and system configuration, to effectively demonstrate the action in the drainage line, and the appropriateness or not of these water closets in these specific situations.

Such failure to clear the drain line could well have a significant negative impact on the public health and safety. [The regulation of plumbing systems has traditionally been vested in the building and plumbing codes enforced at the local—on the site—level; the basic motivation behind the codes system is protection of the public health and safety. This legislation would tend to reverse that motivation. Such legislation, if it must be, should be done so as to carefully integrate the health and safety factor into the new regulation.]

Please note that we are not suggesting that this will be the case. We are simply pointing out that we do not know—and that until such time as this question has been researched and answered, we feel that to enact a universal mandate would be premature. The ASPE Research Foundation is currently in the process of researching this specific issue, with the support of the NAPHCC Educational Foundation.

It is our hope that when answered, the result will show that there is not any problem in the health area. However, at this time we do not know that with any certainty at all, and until such time as we do know, we feel that this legislative action, as written, would be premature.

We are aware that much has been made of the successful use of these, and smaller, water closets in Scandinavia and Europe, where they have been in common use for many years. However, we understand that this experience is not directly applicable to the U.S., as the common drainage design used there is significantly different from drainage system design commonly specified and code-mandated in the United States.

We also suspect that several individuals identifying themselves as knowledgeable engineers on this subject are supporting and testifying in favor of this legislation as written. To our knowledge, these individuals are not registered Professional Engineers (P.E.), not licensed to practice engineering by their state. These individuals certainly do not speak for this Society, nor apparently do they speak for any significant body of plumbing, mechanical, or similar engineering disciplines.

ASPE has had this issue under consideration for over a year now, since a similar piece of legislation was introduced (and subsequently enacted) in Massachusetts. On May 5, 1989, the Board of Directors of ASPE formally adopted, by unanimous vote, the following statement as the Society's position on the National Plumbing Products Efficiency Act of 1989: "The American Society of Plumbing Engineers (ASPE) endorses and supports responsible efforts at all levels to promote and enforce water conservation. Further, ASPE supports in general the purposes of the National Plumbing Products Efficiency Act of 1989, and many of its specific provisions."

However, ASPE takes strong exception to the inclusion of 1.6 gallons-per-flush (or less) water closets in the mandated standards, for the following reasons:

While some of the 1.6 gallon water closets have been thoroughly researched and found to operate satisfactorily, there has been no research on the impact of these fixtures on building drainage systems and sewage treatment systems. It is seen by the plumbing engineering profession that there may exist the possibility of stop-

pages in the branch drain lines connected to 1.6 gallon water closets, esp. in longer drain branches or long horizontal main drains, a supposition supported by a demonstration conducted by the ASPE Research Foundation in 1986.

A full stoppage occurring in the drainage system requires time to build up to such a degree as it becomes evident and repair can be initiated. In that time, however, the partial stoppage provides an ideal breeding media for bacteria and viruses of various types, and thus creates the potential for a significant hazard to the public health and safety when the full stoppage occurs and the overflow of plumbing fixtures takes place.

Specific research is needed, as is a thorough analysis of the results, before any modification of the full legislative spectrum is done (codes and design standards, as well as municipal regulations), and when done that modification should be coordinated so that everything changes at the same time. Until such time as the necessary research has been completed and analyzed and the impacts (drainage system, municipal sewage system) known, modification of the pertinent existing legislation, or the enactment of new legislation is at best premature and at worst could pose a significant health hazard to the public.

Therefore, ASPE respectfully and strongly recommends that the specific provisions covering the 1.6 gallon water closet [101(a)(1)] be removed from this legislation, and that separate legislation should address 1.6 gallon water closets at such time as appropriate research has demonstrated safe parameters of use and these new parameters transposed into code legislation factors for the low flow condition. Alternatively, this legislation should be mandated for new construction only, where appropriate provision for the drainage system can be made.

This position was adopted strictly because of the perceived potential problem, and the lack of comprehensive, definitive research on this question. As mentioned above, it is not our intention to be unduly reactionary or obstructionist; we do not oppose water conservation, nor do we oppose federal (or local) legislation towards this end. It is *not* our intention to unduly delay the implementation of much of this bill. However, ASPE does oppose the universal mandate for the 1.6 GPF water closet included as written, as being unproven for the scope of applications of this bill.

Therefore, ASPE strongly urges modification of this legislation to accommodate the issues raised herein. Without such modification, ASPE is left no choice but to urge denial of this particular legislation as written.

Thank you very much for your consideration of these comments.

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STATEMENT BY HARVEY W. SCHULTZ, COMMISSIONER, NEW YORK CITY DEPARTMENT OF ENVIRONMENTAL PROTECTION

I am pleased to offer my support to S. 583, the National Plumbing Efficiency Act of 1989.

New York City's low-flow plumbing fixture requirements were signed into law by Mayor Koch on May 15th of this year. Our own survey indicates that the low-flow toilet requirement *alone* will result in a savings of over 13 million gallons of water *per day* in the first year. Extrapolating this amount to what could be saved nationally makes it quite clear that Congress becomes the agent of unnecessary water waste each day it delays enactment of low-flow requirements.

We agree with the bill's sponsors that the setting of plumbing efficiency standards by groups such as the American National Standards Institute (ANSI) is not enough in and of itself, since those standards are voluntary. Given nationwide water supply concerns it is important that the government set a clear example in this area and require compliance with strict standards. Our specific recommendations for this legislation follow.

We believe that Section 102 (New Test Procedures) should be amended to give the Secretary of Commerce greater freedom to test all performance aspects of plumbing fixtures. The Secretary's jurisdiction should go beyond water use and estimated operating costs to include other performance tests, for example, absorption, glazing, staining and flushing efficiency of water closets. We also recommend that the standards set for maximum water use in Section 103 of this legislation (gallons per minute for faucets, replacement aerators and showerheads) should include a standard for constant water pressure in pounds per square inch. New York City's Local Law 29 of 1989 specifies a constant water pressure standard of sixty pounds per square inch for sink and lavatory faucets and showerheads. We recommend use of this figure as a realistic test pressure that is typical of that already in use by, and familiar to, manufacturers and test facilities. Additionally, with respect to requirements for permanent product markings, the model number should be listed in addi-

tion to the manufacturer's name and trademark, and rate of water use. This will aid in identification of the part(s) so that low-flow fixtures and fixture parts can be more easily repaired or replaced.

We support a provision for exemptions as listed in paragraph (f) of Section 103 of S. 583. Examples given in this section include products used in public buildings, schools, hospitals or correctional facilities. It is important to note that other products with special uses that may not be in a special facility, such as a toilet in a private home used by a handicapped person, should also be covered by an exemption. If such products would not be covered by the exemption language in the legislation, we urge a broadening of the language to do so.

Finally, some localities, including several in California and Arizona, have already enacted ordinances requiring ultra low-flow toilets. So has New York State. We support the aim of national uniformity, and the enactment of a waiver process for those localities, counties, states or regional bodies that want to establish programs subsequent to the enactment of federal legislation. However, we believe that those localities with conforming on-going programs should be allowed to continue without being required to obtain a waiver. Certainly the waiver provisions of S. 583 should continue to apply to areas where regulations have been enacted for future programs with effective dates that differ from the nationwide one. However, when local areas have successful programs underway, with compliance and supply requirements being fully met, those programs should be legally empowered to continue. Thus, should national legislation be enacted, we hope our local program can continue without New York City's being required to obtain a waiver.

With the exception of those changes and comments suggested above, we fully support S. 583 and urge the enactment of this federal plumbing standards legislation.

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STATEMENT OF ELROY LARIMORE, PRESIDENT, NATIONAL RURAL WATER ASSOCIATION

Mr. Chairman, the National Rural Water Association appreciates the opportunity to submit testimony to you and other members of the Committee on the important issue of drinking water conservation. In particular, we want to endorse the passage of S. 583, the National Plumbing Products Efficiency Act.

The National Rural Water Association was formed to help rural and small municipal water systems of our nation have a safe, adequate supply of water at an affordable price. Our support of this bill reflects the changing nature and priorities of drinking water systems throughout the country. Traditionally, the income of rural and small municipal water systems has been tied directly to an ever increasing volume of water sold. The more water a system sold the greater its income. With many small systems being either public or non-profit, the need for sufficient volume was tied to increasing operation and maintenance costs. However, in general, water bills were the most inexpensive public utility costs within a community, so drinking water has always been a unique bargain.

With the passage of the Safe Drinking Water Act in 1974, there has been a growing awareness and concern from small systems over the long term protection of the quality of the water they supply. This has led to the purchase of new treatment equipment, better operation and maintenance practices, improved management and, most important, a new emphasis on water conservation. Simultaneously, many groundwater supplies have experienced water shortages which have increased the need for water conservation in many geographic areas.

Numerous rural systems have been part of the evolution from the earlier emphasis on increased volume sales toward a policy of water conservation. To make this change it was necessary to raise water rates to provide adequate income from a reduced consumption per customer. This has required a change in attitude by most water system governing bodies and consumers. Fortunately, there has been wide support for the movement toward an increased investment in water quality and environmental protection and as a result water rates have increased to meet these needs.

The reason for emphasizing this evolution in attitudes toward water usage in rural and small municipal water systems is to point out that the small water systems throughout the country will benefit from the expanded conservation of water within our homes and businesses. The fact that it costs more to treat water and that water supplies are being depleted places a much higher value on each gallon of water sold. Changed public attitudes in most rural areas have resulted in support for some increase in water rates in order to protect and preserve major sources of high quality drinking water supplies. This trend will grow stronger in the future as

pollution and population growth places a greater strain on our scarce water supplies.

We support the testimony presented to the Committee from the other organizations endorsing this legislation. Reduced water usage will result in reduced treatment cost both in water plants and in wastewater facilities. This will also result in reduced energy consumption, thus less expense for the systems, which results in lower costs to the consumer. This coupled with the obvious conservation of water resources makes this bill one that our Association supports.

In conclusion, the position of NRWA is illustrative of the change in attitudes over water conservation in this country. Ten years ago small water systems would have opposed measures that would have reduced their revenue through reduced water volume sales. Today as water becomes an ever increasingly scarce resource, there is strong support for meaningful and effective water conservation policies. Ten years from now we will look back and wonder why there was any doubt for the need for this new national water conservation program.

Thank you for the opportunity to express our views on S. 583 and we invite you and other members of the Committee, as well as Committee staff, to visit a rural water system to view first hand the need for a strong national water conservation program.

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JOHN F. LONG,
*September 27, 1989.*

Hon. RICHARD BRYAN,
*Chairman, Consumer Subcommittee, Hart Senate Office Building, Washington, DC.*

DEAR MR. CHAIRMAN: With regard to S-583 we request this statement be made a part of the hearing record.

We strongly support the establishment of Federal standards for the manufacture and labeling of certain plumbing products as proposed in S-583.

John F. Long Homes, Inc. was founded in 1947, and since that time we have built over 35,000 homes in metropolitan Phoenix.

Since 1981 we have installed ultra-low volume (ULV) toilets in our homes, in an effort to reduce water waste and help to preserve our most precious natural resource. We imported the IFO Cascade model, which uses only three litres (.8 gallons) per flush (g.p.f.) from Sweden.

Our homeowners reaction has been very positive. We have had no unusual problems as a result of our eight years of experience with these extremely low flow fixtures.

We feel it is important to make this point in answer to the inevitable question which arises pertaining to the adequacy of water volume discharged from low flow fixtures to move waste solids. Our positive experience has been obtained even though using .8 (g.p.f.) fixtures, which provide only half as much discharge flow as S-583 allows.

In view of this history of very satisfactory performance, we feel the concern over the movement of solids is unfounded. I might add that these results were achieved without any change whatsoever in the diameter or the degree of slope in any sewer lines.

As further support we offer copies (enclosed) of a technical report entitled "The Performance of Ultra-Low-Volume Flush Toilets in Phoenix" by Damann L. Anderson and Robert L. Siegrist. This report compares the performance of ULV toilet fixtures in one of our subdivisions versus the standard 3½ g.p.f. toilets used in another of our subdivisions. These two locations were very similar in all other respects, floor plan, square footage, family size and income.

Thank you for your consideration of our input in this matter. If we may provide additional information, please let us know.

Sincerely,

JOHN F. LONG,
*President.*

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*October 2, 1989.*

Hon. RICHARD BRYAN,
*Chairman, Consumer Subcommittee, Senate Commerce, Science, and Transportation Committee, Washington, DC.*

DEAR SENATOR BRYAN: Currently before the Committee is S.583, the National Plumbing Products Efficiency Act of 1989. As you know, water availability for

growth and development in Southern Nevada is of key importance. Water reserves can be expanded either by finding additional sources of supply or developing conservation measures to expand existing supply. Both components are critical if we are to meet tomorrow's water demand. In light of this, we are naturally in support of all measures that promote conservation of our water resources, including installation of water efficient fixtures.

Thank you, Senator, for your consideration in this matter.

Sincerely,

PATRICIA MULROY,
*General Manager.*

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DELAWARE RIVER BASIN COMMISSION,
*West Trenton, NJ, September 28, 1989.*

Hon. RICHARD BRYAN,
*Consumer Subcommittee, Hart Senate Office Building, Washington, DC.*

DEAR SENATOR BRYAN: On behalf of the Delaware River Basin Commission, I would like to offer testimony on behalf of the proposed National Plumbing Products Efficiency Act. The Commission is an active proponent of water conservation and supports the intent of your legislation.

By way of background, the Delaware River Basin Commission was created in 1961 pursuant to a Federal-Interstate Compact. Its jurisdiction is the Delaware River Basin, which includes major parts of Delaware, New Jersey, New York, and Pennsylvania. Approximately 7½ million people live within the Basin and about 22 million people obtain all or part of their water supply from the Basin. The Commission is unique when compared to most other regional organizations in that it has regulatory, management, and development powers—as well as the usual planning and coordination functions.

Water conservation has become the cornerstone of the Commission's water supply planning strategy. It makes sense during both drought periods and normal times. In dealing with droughts, the Commission has adopted a regulatory program designed to reduce depletive or consumptive use of fresh water by 15 percent. This is achieved primarily through mandatory restrictions on nonessential water uses. These restrictions, coupled with measures to conserve water in reservoirs, provides the Commission with the regulatory framework to effectively manage droughts. The Commission has also adopted a number of long-term water conservation measures. The key measures or regulations are outlined below.

In June of 1986, the Commission adopted an initial regulation (Resolution No. 86–12) that requires large water users (municipal, industrial, agriculture, institutional, etc.) in the Basin to measure their withdrawals at the source, and record and report such withdrawals if they exceed 100,000 gallons per day during any 30-day period. In April of 1987, the Commission adopted a companion regulation (Resolution No. 87–3) that requires metering at the service or customer end of the pipe. This regulation applies to 635 Basin purveyors that distribute water supplies in excess of 100,000 gallons per day. At the same time, a third regulation (Resolution No. 87–6) was adopted. It requires the same group of purveyors to develop and undertake systematic programs to monitor and control leakage in their water-supply systems.

In January of last year, the Commission adopted Resolution No. 88–2, which sets water conservation performance standards for plumbing fixtures and fittings. The fixtures and fittings affected by the regulation include faucets, showerheads, urinals, and water closets. The regulation applies to fixtures and fittings installed in new construction and renovation. On May 24 of this year, the Commission amended the regulation to require low consumption water closets (1.6 gallons per flush) effective January 1, 1991. We estimate that this action will result in a significant reduction in water use in the Basin—an estimated savings of 42 million gallons of water per day by the year 2020. This reduction in water use might defer about $250 million in capital costs for additional or expanded water supply and wastewater treatment facilities.

Besides the above-mentioned regulations, the Commission has also embarked upon a number of public information and education programs to promote water conservation. In particular, the Commission sponsored technology transfer sessions in 1988 with representatives of two major industrial groups to promote water conservation through "best management practices." The first session was held with representatives of the pulp and paper industry; the second with representatives of the chemical and pharmaceutical industries. Both sessions were well attended. Additional ones will be scheduled.

I have enclosed a copy of Resolution No. 88-2 (Revised) as well as a staff report that provides our rationale for requiring water conserving plumbing fixtures, including low consumption water closets.

Sincerely,

GERALD M. HANSLER.

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SPORTSMEN CONSERVATIONISTS OF TEXAS,
*Austin, TX, September 29, 1989.*

Hon. RICHARD BRYAN,
*Senate Office Building, Washington, DC.*

DEAR SENATOR BRYAN: The Sportsmen Conservationists of Texas (SCOT), representing over 30,000 Texas members and 84 affiliated clubs from across the state, asks that a favorable vote be given S. 583, the National Plumbing Product Efficiency Act.

This bill will conserve water, our most valuable resource, by requiring the production of more efficient shower heads and other plumbing fixtures.

With S. 583 coming up for hearing next Wednesday, we wanted you and your fellow committee members to be apprised of our strong support for this important legislation.

Sincerely,

ALAN ALLEN,
*Executive Director.*

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ROBERT H. BORN CONSULTING ENGINEERS,
*Irvine, CA, September 29, 1989.*

Hon. RICHARD BRYAN,
*Chairman, Consumer Subcommittee,*
*Hart Senate Office Building, Washington, DC.*

DEAR SENATOR BRYAN: This is to record my general support for the referenced bill now before your Subcommittee.

As a practicing civil engineer with over 40 years of experience in the water resources management field at state and local levels of government, and in private practice for the past 19 years, I have a profound respect for any measure which will reduce wasteful water using practices and encourage more efficient use of our valuable local water supplies.

One aspect of the problem, which has not been given sufficient attention, in my opinion, are the standards for low-volume flushing toilet fixtures. It is my observation that great progress has been made in reducing the volume of water consumed per flush. However, I believe that insufficient attention has been given to the quality of the flushing action with some toilet designs, with the resulting effect that as many as two to four flushes are required to evacuate the toilet bowl, and plugging occurs more frequently with some of the newest designs.

There has been significant support for better water conservation practices, as is evidenced by the widespread acceptance of low volume flushing fixtures in local and state plumbing codes. However, it appears that adequate testing standards have not been imposed on manufacturers. As a result, both the general public and municipalities are being short-changed, and there may be no real reduction in water consumption for some fixtures. Further, the consumer must frequently pay for a plumber to unplug his toilet.

Let us simply be sure with any legislation in the field that there is provision for review and testing of the designs of plumbing fixtures so that adequate standards are prescribed and enforced, and so that the public is assured that the fixtures it buys will accomplish the intended purpose. I am not satisfied that existing review processes are adequate to accomplish those worthy purposes.

Thank you for the opportunity to enter these comments in the record of your subcommittee.

Very sincerely,

ROBERT H. BORN, P.E.,
*President.*

SIERRA CLUB,
LONE STAR CHAPTER,
*October 2, 1989.*

CONSUMER SUBCOMMITTEE,
*Senate Commerce Committee, U.S. Senate, Washington, DC.*

HONORABLE SENATORS: With water conservation as one of our top priorities, the Lone Star Chapter of the Sierra Club is pleased to support the above referenced bill, which promotes more efficient use of our water resources. The Sierra Club believes this legislation provides a practical and effective means of dealing with the problem of decreasing supply and increasing demand for water, an item of particular concern to us here in Texas. In the long run, the bill will further the cause of energy conservation and reduce demand on wastewater treatment facilities and reservoirs.

We look forward to the passage of this item. Should you need assistance or further information, please contact me at (512) 477-1729.

Sincerely,

SCOTT ROYDER,
*Office Director, State Conservation Office,*
*Lone Star Chapter of the Sierra Club.*

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ENVIRONMENTAL DEFENSE FUND
*New York, NY, October 3, 1989.*

Hon. RICHARD BRYAN,
*U.S. Senate, Committee on Commerce, Science, and Transportation, Washington, DC.*

DEAR SENATOR BRYAN: I am writing to express the Environmental Defense Fund's strong support for the National Plumbing Products Efficiency Act (S. 583) and to urge you and the members of the Committee on Commerce, Science and Transportation to co-sponsor this bill. The enactment of this legislation would provide a significant contribution to the efficient management of our nation's water supply.

The bill is closely modelled after the National Appliance Energy Conservation Act, which regulates energy consumption by appliances. Water-conserving performance standards and labelling requirements for certain household plumbing products would be required by the bill. If enacted, these standards could cut household water use by up to 25% without any change in consumer behavior. Low-consumption plumbing products that not only meet these proposed standards but also are acceptable to consumers are commercially available. The use of such products would reduce the need for new water treatment facilities and water supplies as well as provide a significant cost savings for the consumer.

Legislative action is particularly appropriate because people's individual water use decisions do not accurately reflect the social costs of water supply. Consumer water bills do not generally reflect even the functional costs of water supply. Other costs not fully reflected are the costs of treating the used water and the environmental consequences of insufficient treatment. Finally, individual water supply costs do not reflect the ecological costs of water use, including diversions of water from such important national treasures as the Florida Everglades, which are threatened by water loss.

Standards for high efficiency showerheads as proposed by the bill would also provide significant energy savings through the reduction in hot water use. It is estimated that the adoption of such standards and the widespread use of such products would save the nation the equivalent of 40,000 barrels of oil per day. This reduction would make an important contribution to the nation's goal of reducing greenhouse gas emissions.

We urge you to consider these benefits and others in anticipation of the Consumer Subcommittee hearing scheduled for this Wednesday.

Sincerely,

SARAH L. CLARK,
*Staff Scientists.*

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MISSISSIPPI WILDLIFE FEDERATION,
*Jackson, MS, October 4, 1989.*

Hon. RICHARD BRYAN,
*Senate Office Building, Washington, DC.*

DEAR SENATOR BRYAN: The Mississippi WIldlife Federation strongly supports Senate Bill 583. Water conservation is a very important issue in Mississippi, and our

citizens are becoming more and more aware of the need to do everything we can to conserve this precious resource.

We endorse the National Plumbing Products Efficiency Act and encourage you to do whatever you can to see that S.B. 583 is passed.

Sincerely,

GERALD R. BARBER, CEO.

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LOWER COLORADO RIVER AUTHORITY,
*Austin, TX, October 4, 1989.*

Senator RICHARD BRYAN,
*Consumer Subcommittee of the Senate Committee on Commerce, Science, and Transportation, U.S. Senate, Dirksen Senate Office Building, Washington, DC.*

DEAR SENATOR BRYAN: I am submitting this letter to you in support of the National Plumbing Products Efficiency Act (H.R. 1185/S. 583). The proposed legislation is consistent with the Lower Colorado River Authority's (LCRA) Water Conservation Policy (WFC 509.00), which provides direction for LCRA's leadership role in promoting water conservation. (see attached)

LCRA has taken several steps to promote the "advanced" plumbing standards proposed in the legislation. These steps include:

A requirement that all new and amended LCRA water customers adopt the new plumbing standards on or before January 1, 1990. Approximately 30 LCRA water customers are affected by this requirement.

Support for the proposed revision of existing plumbing code standards by the City of Austin.

Installation of over 100 low-volume toilets (1.6 gal/flush or less) in LCRA facilities. To date, no unusual problems have been reported and user acceptance has been satisfactory.

Once again, we view the proposed national plumbing fixture standards as complementing and reinforcing State, regional, and local initiatives. Importantly, national standards will greatly reduce market uncertainties caused by differing State and local requirements. If we can be of further assistance or provide additional information, please feel free to call.

Sincerely,

S. DAVID FREEMAN,
*General Manager.*

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CITY OF FREDERICK, *October 11, 1989.*

Hon. ERNEST HOLLINGS,
*Chairman, Committee on Commerce, Science, and Transportation, U.S. Senate, Washington, DC.*

DEAR SENATOR HOLLINGS: The purpose of this letter is to request your support for S. 583—the National Plumbing Products Efficiency Act of 1989, and we respectfully ask that you have this letter read into the record. The Board of Aldermen and I would like you to consider co-sponsoring this bill and/or show your support by voting for it.

As you may be aware, the City of Frederick is very concerned about water conservation. Within the last few years, we have had to impose water restrictions on City residents because of the severe water shortage we and other municipalities have experienced. Measures like this proposed bill will enhance conservation steps we have already taken. For example, the City of Frederick has instituted a water conservation program which requires that any new construction must include ultra low volume water closets. These water savings toilets need only 1.6 gallons of water for effective use. This is the same amount of water which is proposed in S. 583. From the feedback we have received, homeowners have noticed a reduction in their water bills.

The City of Frederick is pleased with the effectiveness of our water conservation program. Interestingly enough, we are the only City in Maryland that has such a program. It seems appropriate that other, larger cities in this state and across the country should have a conservation program. Water is our most important resource, and it should be conserved. We will continue to look for ways to enhance the steps

we have already taken, and hope that your support of this bill will allow others to do the same.

Sincerely,

RONALD N. YOUNG,
*Mayor, City of Frederick.*

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AMERICAN STANDARD INC.,
*October 11, 1989.*

Hon. RICHARD H. BRYAN,
*Chairman, Consumer Subcommittee, Committee of Commerce, Science, and Transportation, U.S. Senate, Washington, DC.*

DEAR SENATOR BRYAN: We would appreciate having this letter put in the hearing record for the hearing on S. 583 held on October 4, 1989. Following are our comments on S. 583.

American-Standard is committed to the preservation of our water supply especially in light of the recent drought conditions experienced by areas of our country. We introduced the first water saving toilet combination in 1969, which at that time reduced consumption by one-third. In addition, American Standard assumed the leadership role when the industry subsequently adopted the current three and one-half gallon standard.

After reviewing the provisions of S. 583, we feel strongly that the imposition of a 1.6 gpf maximum flow requirement is premature, impractical and unnecessarily involves the federal government in what rightfully should be state concerns. It elevates what has been a series of regional concerns to the national level and creates a federal bureaucracy to establish and administer policy at the public's expense.

The industry is, by and large, regulated by model code agencies, i.e. IAPMO, BOCA, SBCCI, and NSPC with individual states currently having the option of either adopting a model code or developing their own. This gives them the freedom to decide which aspects of the applicable standards are of most interest locally. Enforcement of these regulations have been very efficient and carried out through the normal process of building permits and on-site inspections.

Aside from the jurisdictional issues, an examination of water usage data indicates quite clearly that residential applications account for an insignificant portion of our overall consumption. Even a cursory examination of the situation suggests that agriculture, industry and power generation consume the greatest proportion of our water.

The plumbing industry is undergoing a transition toward more efficient fixtures. To that end, we are all anxiously awaiting the publication of revised ANSI standards dealing with specific performance criteria for super water saver closets. We now have reason to believe that this will be accomplished within the next twelve months. This will afford industry the opportunity to design new closets to meet a consensus view of acceptable performance criteria.

All full-line manufacturers have a great variety of water closet types and styles. It would be unrealistic to expect the complete range of product offerings will be converted by 1991, especially with the publication of applicable performance standards not scheduled to be completed for a year. It is also imperative to understand that the water closet is part of a system. This country has developed an extremely efficient network of piping in its sewer systems which can be threatened by improperly designed water closets. We firmly believe that before we convert to new closet designs on a national basis, every effort must be made to assure ourselves that the "system" will still function adequately. Clogged sewer systems are typically cleared by being flushed with extremely large quantities of water.

Withut the proper balance of toilet seal depth, venting and sewer system performance, water closets could allow sewer gas to escape into living quarters creating a health and safety hazard. These issues have been raised by the American Society of Sanitary Engineers.

Overall, we believe that a 1.6 gallon standard is premature and will result in problems for consumers and distributors as well as for manufacturers:

The first products in the market will require additional cleaning and most probably will be somewhat more expensive. In addition, consumers will be faced with a minimum of model selections and color choices in the short term.

Builders will be faced with the problem of not being able to obtain the variety of water closet types required for projects. This could result in job delays and contractual penalties.

Plumbing products distributors will be faced with the problem of eliminating current inventories while ensuring replacement orders of the new design types can be secured.

The controlling agencies will be faced with the problem of testing and approving new products in the absence of a national standard for verifying performance.

In summary, American-Standard believes that a national law is unnecessary and any requirement for the restriction of performance of all water closets to 1.6 gallons per flush in the near term is unrealistic and likely to cause unnecessary disruption. We are opposed to S. 583. For your further information on the American-Standard position on water conservation we have enclosed copies of some of our presentations.

Sincerely,

JAMES E. WOLF.

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TEXAS COMMITTEE ON NATURAL RESOURCES,
*Austin, TX, September 27, 1989.*

CONSUMER SUBCOMMITTEE OF THE COMMERCE COMMITTEE,
*U.S. Senate, Washington, DC.*

DEAR CHAIRMAN AND MEMBERS: Texas Committee on Natural Resources, a twenty-year-old statewide conservation organization with nearly a thousand members, urges you to vote S. 583 out of subcommittee with a strong recommendation for its passage by the full committee.

Setting nationally uniform standards for water-using fixtures and appliances is sensible, both economically and environmentally. Use of water-efficient plumbing and washing appliances will inconvenience no one, but the country's staggering waste of easily-conservable water, and its accompanying waste of energy, will be significantly reduced by implementation of S. 583. In addition to direct savings of water, energy, and wastewater treatment, other natural resources lost to construction of reservoirs for water supply (such as valuable bottomland hardwood forests) will be conserved.

Please support S. 583 at its hearings scheduled for October 4.

Sincerely,

EVERETT HARDING,
*Chairman.*

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CITY OF TAMPA,
*October 11, 1989.*

Hon. ALBERT GORE, Jr.,
*Chairman, Consumer Subcommittee of the Senate Committee on Commerce, Science, and Transportation, Russell Senate Office Building, Washington, DC.*

DEAR SENATOR GORE: Much of Florida and the rest of the nation have faced recurring and increasingly severe water shortages. The City of Tampa has recently announced its plans to implement the most comprehensive water conservation program in Florida. One of five key elements focuses on indoor water use efficiency. The existing plumbing code will be revised and will be modelled after the proposed National Plumbing Products Efficiency Act.

Numerous other municipalities and state governments have realized the need to enhance water conservation efforts through plumbing codes. Because of the activity at the local level and the potential for differing and conflicting regulations, it is imperative that the standard be established nationally.

In addition to consistency among local and state governments, there is also great water saving potential with the proposed bill. The plumbing manufacturers have successfully demonstrated the performance, water savings and public acceptance of the low water using toilets, showerheads, faucets and urinals. Most of these items have been available for several years so providing quantities demanded should not be a problem.

The City of Tampa supports the adoption of the National Plumbing Products Efficiency Act of 1989-S. 583. Congress now has the opportunity to act in a leadership role in conservation by adopting the most comprehensive water saving legislation ever considered.

Thank you for the opportunity to express our viewpoints.

Sincerely,

SANDRA W. FREEDMAN,
*Mayor.*

CONSERVATION FEDERATION OF MISSOURI,
*Jefferson City, MO, October 12, 1989.*

Senator JOHN C. DANFORTH,
*Russell Building, Washington, DC.*

DEAR SENATOR DANFORTH: Last March we wrote to you in support of the National Plumbing Products Efficiency Act, S. 583.

We have learned that the Senate Commerce Committee will soon be considering this bill. We are writing now to reiterate our support and encourage your assistance to get this important bill passed. It will benefit our Missouri communities and provide protection against public water shortages in drought years such as last year, and it will reduce the temptation of the western states to siphon away Missouri River water through major inter-basin transfers.

Please keep us informed on the progress of this bill and what, if anything, we can do to help it achieve final passage.

Sincerely yours,

ED STEGNER,
*Executive Director.*

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COOPERATIVE EXTENSION SERVICE, UNIVERSITY OF MARYLAND SYSTEM,
WESTERN MARYLAND RESEARCH AND EDUCATION CENTER,

*October 13, 1989.*

*Consumer Subcommittee of the Senate Committee on Science, Commerce, and Transportation, Hart Senate Office Building, Washington, DC.*

DEAR MR. CHAIRMAN: Please accept my written testimony for the record in support of Senate Bill S. 583.

In 1983, Frederick City and the Maryland Cooperative Extension Service began the process of developing a Pilot Water Conservation Program. After months of planning, a program was developed that would involve 80 households throughout Frederick City. The homes selected at random would receive water saving devices consisting of low-flow showerheads, aerators, toilet dams, and a leak detection test. The homeowners were asked to leave the water saving devices in place for 18 months. During this period the homes would be monitored for reduction in water consumption.

After the elapsed time, all homes were evaluated. A number of homes had to be removed from the test group due to problems that occurred beyond the control of our inspection team. Thirty-three homes remained in the test group. In one year these thirty-three homes saved 237,000 gallons of water and $1,091 in water, sewer, and energy bills. It comes as no surprise that Frederick City implemented a comprehensive water conservation program in 1987.

The City established a goal by reaching 10,000 households or three-fourths of the homes within a five year period. Using the information obtained from the pilot program, the City projected it could reduce water consumption by a half million gallons per day. It was also determined that $150,000 could be saved in water/sewer treatment cost.

Since 1987, the program has been in full implementation and over 3,000 households have received water saving devices. This program has clearly shown that, not only in the urbanized areas, but also in rural areas, saving water is a priority.

The National Plumbing Efficiency Act Bill can only encourage communities very similar to Frederick, but maybe not as progressive, to adopt stronger practices in water conservation. However, other things that need to be considered when implementing any type of water conservation program is the education that needs to be included in a project. The Extension Service has been working very closely with the City of Frederick and has been involved in coordinating the development of news releases, fact sheet, and cable television programs discussing the water program. The Extension Service has also been involved in conducting numerous workshops throughout the City and County informing the public about water saving devices.

I would also suggest that the bill, or any bill that is in support of water saving devices, include some type of rider that would promote education. The other area besides the general public where education needs to be emphasized is with vocational education training. As it has appeared in Frederick County, along with other communities, those that have fought the water conservation efforts the most are individuals in the plumbing industry. I believe if we began to initiate strong educational programs in the vo-ed program we can turn around the misconceptions that people in the plumbing industry have about water saving devices.

This idea that I am presenting, of course, is not included in the Plumbing Fixtures Act, which is primarily dealing with the fixtures themselves, but the important thing here is that when we look at implementing water programs that we have to look at a comprehensive water program. In my view, a comprehensive program includes four components: legislative enforcement plumbing codes, rate structure, and water conservation. These are the four areas I believe that makes up a strong comprehensive water program. The National Plumbing Efficiency Act will be only one aspect of a comprehensive program, but also one that is very vital to getting a program of this nature off the ground.

Again, I fully support Bill S. 583. I believe it is a very timely Bill; one that is greatly needed and one that the support of local government in rural and urbanized areas can support and implement in their communities.

Sincerely,

MICHAEL L. SOWELL,
*Regional Specialist,*
*Community Development.*

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WATER CONTROL INTERNATIONAL, INC.,
*October 13, 1989.*

Hon. RICHARD H. BRYAN,
*Chairman of the Consumer Subcommittee, Committee on Commerce, Science, and Transportation, U.S. Senate, Washington, DC.*

DEAR SENATOR BRYAN: For the last eighteen years our company has been devoted exclusively to pioneering the use of low consumption toilets in the United States and currently, manufacture and sell more flushing devices used in activating these (less than 1.6 gallons) water closets than anyone else in the world. Besides serving the U.S. market, our technology is also becoming very popular in Europe.

Despite our deep and long standing concern with water conservation, and the fact that the proposed Atkins-Fowler legislation (that your subcommittee recently considered) would significantly benefit our company, we oppose it because, in the bigger picture, we feel it will not serve the American people as well as the present, non-federal system.

Our reasons for the above opposition to Atkins-Fowler are:

1. The present system has worked extremely well. Proof of this can be seen by comparing any number of federal water use surveys that have been published by the government between 1970 and 1988. These show that the present non-federal standard development process has achieved a greater percentage reduction in household water consumption over the last fifteen years than has been accomplished by federally funded energy programs. Simply, the present system, even with all its imperfections, is more efficient than the proposed alternative. Why change it?

2. To the American people, the present system's greatest value is the nature of its "checks and balances". Frankly, it is very hard and cumbersome to pioneer a new technology through fifty separate states. Yet, in looking back on this task, we now realize the immense benefit that that had on the development of our technology. Different regional needs were clearly reflected in their reactions, comments and objections. To make our technology really viable, we had to adjust to all these views by further development and improvement. Frankly, it kept our company "lean-and-mean" and much more efficient than if we had simply obtained one federal approval—as would be the case under Atkins-Fowler. The net result is that American voters are better off.

3. If federal legislation is not approved, the objectives of the Atkins-Fowler Bill will be accomplished anyway. Without federal legislation, the present system will cause full U.S. conversion to low consumption toilets in only two or three years longer than Atkins would theoretically legislate. However, the advantage to this slight delay is avoidance of error, better quality and lower costs. From experience we know that new innovations and designs, rushed too quickly to market, almost always contain errors. Errors in this subject can be very serious because of the possibility (for example) for improper protection against cross-connection (separation of waste water from fresh water systems) etc.

As was testified at the hearings, already 40% of the United States is now under state or regionally mandated low consumption toilet laws. As a result, we are not far from the point at which water closet manufacturers cannot economically justify producing two different kinds of products for two markets. Thus, as occurred back in the 70's, when the switch from conventional-type toilets (5½ to 8 gallons per flush) to water-saver type (3½ gallons per flush) occurred, manufacturers found that

they had to convert 100 percent to the lower consumption technology in order to retain the economics of scale. Thus, even without federal legislation, the whole country will be forced to accept low consumption toilets. The other types simply will not be available. This transition will occur as fast as manufacturers can responsibly convert capacity to produce these new products—not by the creation of some fictitious date.

For the above reasons, we believe that the present system is better than that provided by Atkins-Fowler and that the same good objectives of the federal proposal will be accomplished—without the proposed legislation, but with "checks and balances" that will benefit all Americans.

Sincerely,

R.B. MARTIN.

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INSTITUTE FOR FIRE AND BURN EDUCATION,
*October 17, 1989.*

U.S. SENATE COMMERCE SUBCOMMITTEE,
*Committee on Commerce, Science, and Transportation, Washington, DC.*

DEAR SIRS: The Institute for Fire and Burn Education, which is the main thrust behind National Burn Awareness Week, has been assembling information on Halon fire extinguishers for several years. As a consequence, the Institute has become a staunch supporter of the use of Halon as a fire extinquishant.

More specifically, the Institute endorses the use of Halonaire, which is a blend of Halon 1301 and 1211 and is the most effective and least pollutant of the Halon extinguishers. (See the attached descriptive material).

Insofar as its effects on the ozone layer and the environment are concerned, it is our conclusion that Halonaire's effect on the environment is so miniscule that to deny the world and specifically our country the benefits of this protective substance for environmental purposes is ridiculous.

Halonaire units are absolutely sealed with no leakage whatever. They contain no nitrogen which requires recharging every six years. They are self-sealing after use and have an indefinite shelf-life. When used on a fire there is immediate decomposition with no effect on the environment. They maintain constant pressure and require no servicing. These facts and others are embodied in the enclosed literature.

The use of the blend of Halon 1301 and 1211 on clothing which is afire not only extinguishes the fire but penetrates the clothing to arrest the effect of burns on the body reducing the burn damage thereon.

To ban this revolutionary protective substance would be akin to returning to fighting fires with bucket brigades. We of the Institute cannot believe that the banning of such an effective substance in fighting fire and burns for the reasons advanced would be in the best interest of our citizenry. We trust that the congress will summarily dismiss the idea of depriving our citizens of something so necessary to fire prevention and burn suppression.

In conclusion, I doubt that the approximately 20,000 victims of death by fire or the approximately 1,250,000 burned or injured (*) as a result of fire would have been interested in making their sacrifice for the benefit of something so tenuous as an ozone layer which may or may not change in the next 1,000 years.

We would be happy to appear before the committee to further state our case.

Respectfully yours,

FRED JAMESON, *CEO.*

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CITY OF FREDERICK,
*Office of Planning and Engineering,*
*October 13, 1989.*

Hon. ERNEST HOLLINGS,
*Chairman, Committee on Commerce, Science, and Transportation, U.S. Senate, Washington, DC.*

DEAR SIR: The City of Frederick, Maryland adapted as code to use 1.6 gallon flush water closets effective September 1, 1988, for residential use only.

We have approximately 1,000 of these installed in the past year and have had few problems or complaints from either the industry or the consumer. The few complaints received were more probably an error in adjustment by the installer and not the fixture itself. No problems in clogging have been reported. We, as the City inspection agency are very satisfied with the performance of these ULV 1.6 Gallon flush water closets at this time.

We request this letter to be read into the record.
Sincerely,

ROGER C. MYERS,
*Chief Plumbing Inspector.*

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WASHINGTON GOVERNMENT AFFAIRS OFFICE,
*Washington, DC, October 18, 1989.*

Senator RICHARD BRYAN,
*Chairman, Consumer Subcommittee, Commerce, Science, and Transportation Committee, Hart Senate Office Building, Washington, DC.*

DEAR SENATOR BRYAN: The American Supply Association (ASA) wishes to offer the following comments to be included in the Subcommittee's record of the October 4, 1989 hearings on S. 583, the National Plumbing Products Efficiency Act.

ASA is the national association representing wholesalers and distributors of plumbing, heating and cooling products. Plumbing fixtures form a significant part of the plumbing wholesaler's business. It is the plumbing wholesaler who supplies plumbing contractors, retail dealers, builders, as well as commercial and institutional users.

Our association and its members strongly support continued efforts to achieve increased water conservation. In fact, through the ongoing initiatives of the plumbing industry, a safe and efficient standard for water conservation has been established. And the plumbing industry is moving ahead with the development of a performance standard for low-consumption water closets. Once this standard is finalized under the auspices of the American National Standards Institute (ANSI), the industry will be in a position to take the next step toward increased water conservation.

Mr. Chairman, we have serious concerns about S. 583. We believe the water-flow levels mandated by this legislation are premature and, as such, may undermine the safety and effectiveness of this nation's waste disposal system.

At this point in time, no one can say with any degree of certainty what will be the effect of low-consumption closets on the integrated waste disposal system. To avoid possible health and sanitation repercussions, substantive research must be undertaken and a thorough analysis completed on the effect of these low-flow fixtures on the waste disposal system. To date, this has not been accomplished, although the American Society of Plumbing Engineers (ASPE) and the National Association of Plumbing, Heating, and Cooling Contractors, has inititated such research. However, ASPE and NAPHCC are not expected to complete their work in this area possibly until 1991.

The limited experience so far with low-consumption closets is simply not sufficient to determine their impact on waste disposal. Anecdotal information and limited analysis from such communities as Glendale, Arizona, does not provide enough information to indicate what the results might be elsewhere—particularly in areas of the northeast where many of the country's oldest waste disposal systems are in use.

Not only are the standards set by S.583 premature, but ASA also strongly questions the need for the federal government to support the private industry standards-setting process—which has been carried on skillfully and effectively for many years. The plumbing and waste disposal system in this country is second to none. Ours is the safest, most convenient, efficient, and effective system in the world. The plumbing industry is proud of our record and we are deeply conscious of our responsibilities to the consuming public and to the country's need for increased water conservation.

As indicated, significant efforts are already underway within the industry to develop an effective low-flow standard. Rather than overriding this process, the government should instead provide encouragement and support.

We urge the Subcommittee to proceed with caution. Conservation efforts will ultimately fail unless these very real engineering concerns are taken into account. And, Congress also needs to better ascertain whether the public is prepared to accept such sweeping changes in a technology that is so much a part of everday life.

Thank you for your consideration of our views.

Sincerely,

PATRICK C. O'CONNOR,
*Washington Representative.*

FAIRFAX COUNTY WATER AUTHORITY,
*Merrifield, VA, October 18, 1989.*

COMMERCE, SCIENCE AND TRANSPORTATION COMMITTEE,
*Consumer Subcommittee. U.S. Senate, Washington, DC.*

GENTLEMEN: This letter is written to acquaint the Committee with some of my concerns about the adoption of a new National Plumbing Code (referenced above) calling for more stringent conservation fixtures that may not have been addressed to date and to suggest a possible alternative.

I will preface the letter by bringing to your attention that the Fairfax County Water Authority is extremely supportive of water conservation. A copy of our Conservation Policy is enclosed. Further, we were one of the first (1974) water systems in the nation to adopt a conservation rate structure, which is still in affect today.

We should be extremely careful in the adoption of any new regulations or codes because the regulatory agencies do not have the leeway to apply same in a discretionary or rational manner, depending on the logic of the situation. Once adopted it becomes mandatory for everyone regardless of whether or not it is logical for the particular situation. This is the very reason Canada did not revise their National Plumbing Code to include conservation fixtures.

It is on this basis that I submit the following for your consideration:

1. The reality of our experience since the installation of conservation fixtures is that although we are selling less water per residence for internal sanitary water consumption our total demand per residence has increased.

2. In many instances the water purveyor must provide a minimum pressure in the range of 35 PSI for the fixtures to operate. In some instances we have had to increase the pressure, sometimes at great expense, in areas with conservation fixtures because of low pressure complaints, even though older areas with pre-conservation fixtures are operating satisfactorily at these same nominal pressures.

3. The current water conservation fixtures, except water closets, are set to operate at a rate based on a set pressure. If the pressure is high, 60 pounds per square inch (PSI) to 80 PSI, then they discharge more water, if the pressure is low the reverse is true.

4. When the water purveyor is required to increase pressure at higher elevations it raises the pressure for a larger area, i.e., from 25 to 35 PSI; 35 to 45 PSI; 45 to 55 PSI; 55 to 65 PSI, etc. as you descend in elevation, thus causing more water to be used, which to some degree defeats the purpose of water conserving fixtures.

5. The increase in pressure has the effect of wearing out washers and automatic valves at an accelerated rate. It also enhances the potential for system leaks or increases losses of water if system leaks do occur. The system could be wasting more water than is being saved by the installation of conservation fixtures.

6. In addition, if higher overall pressures on a system are required it generally creates a need for more pumping and storage. Besides wasting electrical energy this creates a longer detention time for water in the system, which reduces the chlorine residual, thereby enhancing the potential for Trihalomethanic development and bacteria growth. The most effective means of combating this situation is periodic system flushing, thereby wasting more water. Since conservation fixtures have been required our unaccounted for water has increased tremendously, which is partially attributed to system flushing.

These comments are not intended to imply that conservation of water is not a benefit to everyone concerned, especially relative to the reduction of waste water discharge. However, wastewater treatment costs are also a function of the strength of the waste water pollution as well as the quantity of transportive water. In my opinion there may be a less costly and more efficient method of conserving water without requiring the water purveyor to increase pressures.

As described at the outset the function of the fixtures depends on the applied water pressure. Therefore it would appear that if each residence whose pressure exceeds 40 PSI was equipped with a pressure regulating valve (PRV) on the main building water service whereby the setting could be readily adjusted to suit the needs of the occupant, we could accomplish water conservation without a system-wide increase in water pressure. This would only involve a minor change of the existing pressure reducing valves currently available simplifying the setting mechanism. Generally speaking when the system pressures are low you have automatic water conservation. The same is true for individual residences. The only internal fixtures that would not be affected would be the water closets.

We should always be wary and not be hasty with the adoption of new national codes on water fixtures. These new fixtures replace the old fixtures available on the market and maintenance parts for existing fixtures become unobtainable. Therefore, unless they are designed properly, those residing in low pressure areas or on indi-

vidual well systems (where the pressure usually operates between 20 PSI and 40 PSI) could have problems with their fixtures.

Many parts of our nation do not have a water supply problem. In addition their waste water treatment effluent is of such high quality as to be an asset to the receiving stream. Therefore the water customers should make their own economic choices relative to conservation. During drought periods a jurisdiction could request or demand a water reduction and the resident could simply adjust their PRV for compliance.

If you desire further information concerning this matter contact the undersigned at your convenience. Any consideration that you can give this matter would be appreciated.

Very truly yours,

FRED P. GRIFFITH, Jr.,
*Engineer-Director.*

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STATE OF NEW YORK, DEPARTMENT OF ENVIRONMENTAL CONSERVATION,
*Albany, NY, October 19, 1989.*

DEAR SENATOR BRYAN: I wish to respectfully submit the following comments on behalf of the proposed National Plumbing Products Efficiency Act, S. 583.

Due to the increasing environmental consequences and economic costs of developing new water supplies and of providing high quality water from existing supplies and the recurrent droughts which have affected New York over the past decade, the Department of Environmental Conservation has made everyday water conservation a primary program initiative. With a few reservations, New York State supports the proposed bill because it presents a reasonable approach to establishing plumbing fixture standards which will help meet water conservation goals. Plumbing fixture standards can save hundreds of millions of gallons of water each day without any undue cost or inconvenience to the public.

New York State has had a plumbing fixtures law (attached) since 1980 which mandates maximum flow standards for any showerhead, water closet, faucet or urinal sold, imported or installed in the State. That law was recently amended to reduce the water closet standard from 3.5 to 1.6 gallons per flush, effective in January 1992. The lavatory faucet standard was also reduced, from 3.0 to 2.0 gallons per minute, effective in January 1991. The amendment also requires product testing and labeling. The State law is expected to save over 340 million gallons of water each day compared to the pre-1980 standards, as new plumbing is installed and existing plumbing is gradually replaced with water-conserving fixtures. Over 140 million gallons per day of those savings will accrue from the new water closet standard.

The Delaware River Basin Commission (DRBC), which regulates water withdrawals in the four-state basin, has also passed a plumbing fixtures regulation in order to conserve the waters of the Basin.

A comparison of the current New York law and Delaware River Basin Commission (DRBC) code (effective January 1991) with the proposed federal legislation follows (units are in gallons per minute or gallons per flush, as appropriate):

| | Fed bill | DRBC | NYS law |
|---|---|---|---|
| Plumbing device: | | | |
| Water closets | 1.6 | 1.6 | 1.6 |
| Urinals | 1.0 | 1.5 | 1.0 |
| Showerheads | 2.5 | 3.0 | 3.0 |
| Lavatory faucets | 2.0 | 3.0 | 2.0 |
| Lavatory replacement aerators | 2.0 | [1] NA | [1] NA |
| Kitchen faucets | 2.5 | 3.0 | 3.0 |
| Kitchen replacement aerators | 2.5 | [1] NA | [1] NA |

[1] NA is "not applicable."

It should be noted that extensive research on product quality and availability and consumer acceptance was completed and evaluated by the DRBC and the New York State Department of Environmental Conservation before the water closet standard was revised and that similar data were available to support the new lavatory faucet standard. We believe the same review should be conducted before the kitchen faucet standard is changed to 2.5 gallons per minute, as proposed in the legislation. The key to achieving a successful conservation program is to ensure availability of qual-

ity products that are acceptable to consumers. As for the showerhead standard, there are products available which meet your proposed requirement, but they have not been subjected to a quality control review. In the long run, your legislative intent may be more easily and quickly realized if a study of product quality and availability were performed for these fixtures, as was the case for the water closet standard.

Title I, Sec. 102, Part (a)(2) of the bill calls for testing and labeling requirements which measure the estimated annual operating cost of a covered product during an average use cycle or period of use. The bill also amends the Energy Policy and Conservation Act to require dishwashers and clothes washers to include water use and water cost information. These requirements parallel appliance energy use labeling requirements. However, the price of water varies so widely around New York and the nation as to render such a figure nearly meaningless. Should the price be displayed for an average use cycle, numbers could be so low that a consumer might get the contradictory message that water use is not important. I suggest that required labeling include only water use and that it be displayed in gallons per cycle or per average use, plus average gallons per person per year of use.

Section 102, Part (b)(1) of the bill requires the Secretary of Commerce to periodically reevaluate test procedures. Reevaluation must take place within three years and "from time to time thereafter." I suggest that the timing of required reevaluation be at least every two years or as needed. Otherwise, the requirement might be ignored.

The bill would preempt state plumbing fixture flow standards, testing requirements and procedures for information disclosure which are less restrictive than those promulgated by the federal government, unless the state proves that such regulation is needed to meet unusual and compelling state or local water interests. A uniform minimum federal standard would facilitate enforcement of standards by eliminating the problem of non-complying fixtures entering from out-of-state distributors.

With the noted exceptions, I wish to go on record in support of the proposed legislation.

Sincerely,

THOMAS C. JORLING.

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ENVIRONMENTAL RESOURCES RESEARCH INSTITUTE,
THE PENNSYLVANIA STATE UNIVERSITY,
*University Park, PA, October 20, 1989.*

Hon. RICHARD BRYAN,
*Chairman, Consumer Subcommittee, Hart Office Building, U.S. Senate, Washington, DC.*

DEAR SENATOR BRYAN: I am writing to offer my support for legislation to require water conservation standards for plumbing fixtures and appliances.

I have been involved in research to determine the effectiveness of such requirements in helping resolve this nation's problems with excessive water and energy use and wastewater production. This research which spans the last 15 years has convinced me that water conservation standards for water using appliances and plumbing fixtures are necessary and highly desirable.

I urge your subcommittee to give this matter favorable consideration.

Sincerely,

WILLIAM E. SHARPE,
*Professor of forest hydrology.*

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KOHLER CO.,
*October 20, 1989.*

Hon. RICHARD BRYAN,
*Chairman, Consumer Subcommittee, Hart Office Building, U.S. Senate, Washington, DC.*

DEAR SENATOR BRYAN: Kohler Company, the nation's leading manufacturer of plumbing and specialty products, appreciates the opportunity to provide supplementary comments on the proposed National Plumbing Efficiency Act of 1989 (S.583/HR1185). We request that these comments be incorporated into the public record which began with the October 4 hearing under the jurisdiction of the Subcommittee on the Consumer of the Commerce, Science and Transportation Committee.

Kohler Co. is opposed to the proposed legislation because it is unnecessary; the plumbing industry has re-engineered its product, and ultra low flow fixtures are available in the market place. It is also unnecessary because there has been a strong move at the state and local level to enact 1.6 gpf regulations. We are opposed to the bill because it is untimely. Without benefit of an ANSI standard and the American Society of Plumbing Engineers' study on drain line carry, the industry is not confident that high product performance standards will be maintained and that these fixtures will work within existing plumbing systems.

First and foremost, Kohler Co. joins the entire plumbing industry in actively supporting effective and meaningful water conservation efforts. The plumbing industry has been at the forefront of water conservation since the early 70's. The Kohler Co. markets many water-saving products, and was one of the first U.S. companies to introduce water-saving 3.5 gpf toilets. With the nearly universal change over to 3.5 gpf toilets, the plumbing industry has achieved a 40% greater water efficiency for toilets.

Sensitive to both market conditions and state regulations, the industry has again been responsive to water conservation initiatives by designing and producing ultra low flow toilets which flush on 1.6 gpf. The Plumbing Manufacturers Institute, our trade association, recently conducted a survey on 1.6 gpf availability. The industry record is noteworthy. In 1987, 30,000 ultra low flow toilets were available. In 1988, we saw that number increase to 195,000 units. The estimated projection for 1989 is 1.1 million units, and we further project that 2.4 million ultra low flow toilets will be available in 1990. There are between 8 and twelve million toilets sold annually in this country. Looking at the estimated projections, we see that by 1990, two years before the mandated time frame put forth in the proposed bill, nearly 25% of all U.S. water closets will be 1.6 gpf models. The industry projections don't go out as far as 1992, but you can be assured that the majority of all toilets produced will be 1.6 gpf models.

We maintain that S.583 is unnecessary. American plumbing manufacturers have been aggressively pursuing the major re-design requirements of these products, their production and marketing. No federal mandate, federal legislation, or a federal bureau is needed to prod this industry.

Additionally, we believe the correct level of regulation is at the state and local levels through the adoption of state and local plumbing codes. Again, we can point to impressive figures which demonstrate that regulation at this more appropriate level is occurring, making federal intervention unnecessary. Since Massachusetts passed the first state-wide ultra low flow bill in 1988; the states of Rhode Island, New York, Connecticut, Washington, California and the Delaware River Basin Commission have adopted 1.6 gpf laws. It's been estimated that by 1992, 40 percent of the country's population will be regulated by low-flow laws and ordinances. We believe that this figure will increase and the areas of the country facing either water shortages or wastewater treatment deficiencies will adopt 1.6 regulations in the near future.

We'd like to emphasize that without federal intervention, there is a system in place which has in the past and currently regulates the plumbing industry; a system which insures the American consumer the highest standard of health and sanitation in the world. Briefly, this process being with design specification and standards developed by the American Society of Mechanical Engineers or the American Society of Sanitary Engineers. The American National Standards Institute (ANSI) provide performance standards for all plumbing products. The model code organizations review the standards, and if they are approved, they are adopted and incorporated into state plumbing codes and local ordinances. In Congressional Research Service's recently released "Water Conservation: Options for the Residential Sector," Ms. Claudia Copeland notes that there is "remarkable agreement within the industry—manufacturers, distributors and contractors—the system is orderly and has worked well to serve consumers, builders and local officials."

Kohler Co. also has major concerns about the affect of the ultra low flow toilets on the entire plumbing system. Mr. Pat Higgins of P. J. Higgins and Associates; and Mr. George Bliss from the United Association of Plumbers and Pipefitters correctly emphasized during their committee testimony, that a toilet is only one part of an integrated plumbing system. The efficacy of installing 1.6 gpf toilets in existing plumbing systems is questionable. When velocities in the drainage system are reduced, the wastes are less likely to carry as far and will likely separate from the effluent. The American Society of Plumbing Engineers is so concerned about drain-line carry and the resulting health hazards, that they have undertaken a research study to determine whether or not ultra low flow toilets cause system problems.

Without benefit of that study, any federal bill calling for across the board implementation of 1.6 gpf toilets is extremely premature.

Kohler Co. also believes that it is imperative that an ANSI performance standard be adopted. This performance standard will insure that the American publics' requirements for sanitation, consumer acceptability and functionality will be met. The proposed bill is shortsighted in that it references only water use. Domestic Engineers and the Plumbing Heating Cooling Contractors conducted studies on ultra low flow fixtures and found significant problems with bowl cleaning, and cleansing which resulted in double flushing thereby negating any water conservation affect. An ANSI standard, embodied in local codes, will assure that conforming products conserve water while meeting consumer demands for efficient and sanitary waste disposal.

Finally, we are very concerned about the across the board use of 1.6 gpf toilets particularly those mandated for commercial installations. There are significantly greater abuses in a commercial setting, and we strongly believe that the reduced flow of 1.6 gpf will not remove disposable diapers, wads of Kleenex, brown hand towels, and all of the other debris that is disposed of commercially.

The draught last summer focused considerable attention on our nations' water resources, their use and replenishment. There is strong agreement that water use by the residential sector accounts for only 7 percent of all fresh water withdrawals. Assuming that nearly half of that water is used outdoors, indoor use accounts for 3½ percent of all withdrawals or 18½ billion gallons annually; a very small percentage of the 495 billion gallons of water used annually. Because the bill mandates only new construction and retrofit applications, if will take decades to achieve any significant water savings. Surely more effective water conservation measures can be implemented to achieve meaningful conservation goals.

The federal government has a major role in providing a policy agenda for water conservation for the nation. There are numerous ways to achieve significant water conservation efficiencies; agriculture use, leak detection and repair, universal metering, landscape codes, and the appropriate pricing of water are just a few areas to be looked at closely.

The industry and established state and local code bodies have proven an effective and responsive means to achieve conservation, safety and sanitation. The proposed National Plumbing Products Efficiency Act of 1989 is unnecessary, untimely and may negatively impact the entire plumbing system. Kohler Co. is strongly opposed to its enactment.

Sincerely,

BARBARA N. EBENREITER,
*Manager, Government Affairs.*
DAVID A. HARRISON,
*Vice President-Sales.*

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NATIONAL ASSOCIATION OF MANUFACTURERS,
*October 20, 1989.*

Hon. RICHARD H. BRYAN,
*U.S. Senator, Chairman, Senate Consumer Subcommittee, U.S. Senate, Hart Senate Office Building, Washington, DC.*

DEAR SENATOR BRYAN: I am writing on behalf of the National Association of Manufacturers (NAM) to convey our concerns about the National Plumbing Products Efficiency Act of 1989 now before the Consumer Subcommittee on the Senate Commerce, Science, and Transportation Committee. I request that this letter be submitted for the hearing record.

In authoring S. 583, Sen. Wyche Fowler (D-GA) intended to take the first step in developing a plan to conserve water by establishing minimum efficiency standards for plumbing fixtures and products. Water conservation is a laudable goal.

We are concerned that your bill does not sufficiently address the issue of nonpoint source water conservation. As you know, nonpoint sources account for 50 percent of water degradation. In contrast, S. 585 would nationally regulate water flow on plumbing fixtures and products which contribute an insignificant percentage of overall water usage.

Industry's concern with nonpoint sources of water pollution is obvious and direct. Our lack of knowledge of the relationship of nonpoint pollution to water quality is hindering the nation's efforts to develop a water quality program that most effectively remedies pollution problems. Conditions and relations between point and nonpoint sources differ from one part of the country to another, making it difficult to establish a uniform program.

It makes little sense to require national plumbing product standards when uncontrolled nonpoint sources of pollutants are the major contributing factor to an area's water quality problems. What is needed is a balanced approach to point and nonpoint problems, with the major consideration being the water quality of the river basin in question.

NAM is waiting for the results of the Society of Plumbing Engineers research project on drainline carry out to determine the efficacy of these products in retrofit applications. We are also waiting for an American National Standards Institute (ANSI) standard to be published which will ensure that performance requirements that include sanitation, functionality, consumer acceptance and the appropriate water level will be established. Local and state building codes will adopt ANSI standards in order to achieve regulation at this level.

This will also allow decisions to be made on local water quality and quantity, aquifer conditions as well as the use of toilets and plumbing products whether in an institutional or residential setting. National standards would not give adequate flexability to set building codes and standards based on local water usage, quality, quantity, and hydrology.

The NAM remains anxious to work with you on the more pressing issue of how to reduce nonpoint source pollution from municipal sources, agriculture, septic tanks, surface runoff, and antiquated sewage systems. This is a challenge which dwarfs the possible benefit from water conservation through national plumbing standards.

Sincerely,

THERESA PUGH,
*Director, Environmental Quality.*

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OCTOBER 23, 1989.

Hon. RICHARD H. BRYAN,
*Russell Office Building, Washington, DC.*

DEAR SENATOR BRYAN: I am writing in regard to Senate Bill S-583 entitled "National Plumbing Products Efficiency Act." Although I have only read excerpts from this bill, I would appreciate the opportunity to make a few comments.

Briggs Industries, Inc. operates eight (8) manufacturing facilities in the United States producing toilets, bathtubs, faucets, and other plumbing fixtures. We as a company, and individuals, are very concerned about water conservation. (Tampa, the location of our corporate headquarters, is on permanent water restrictions).

As a result of this concern, we have begun producing three models that flush with less than 1.6 gallons per flush. The acceptance by the general public has been mixed, at best. Even in areas that have water shortages. There is reluctance to try something new or different unless it is mandated. Several local municipalities have introduced codes or ordinances requiring 1.6 gallon toilets, but as one official mentioned to me, enforcement is spotty because no one wants to go to court.

The amount of water that can be saved by the lowly toilet is rather significant. Assure a family of four, and one bathroom, and according to U.S. Government statistics each person will flush that toilet four times per day with a standard 3.5 gallon toilet the following would be true: 4 uses $\times$ 3.5 gal. = 14 gals p/pers. $\times$ 4 pers. = 56 gal. p/day (family) $\times$ 365 days = 20,440 gals. p/yr.

With a 1.6 gallon toilet the following would happen: 4 uses $\times$ 1.6 gal. = 6.4 gals. $\times$ 4 pers. = 25.6 gals. (family) $\times$ 365 days = 9,344 gal. p/yr. Savings—11,096 gallons p/yr.

Multiply this by a couple million households and the savings become very significant. Most people associate water conservation with droughts and individual usage, but the savings don't stop there. This reduced volume of water, takes pressure off of filtration plants. The community benefit is derived by fewer raw sewage spills. Reduced spending on new facilities, and smaller lot sizes and drain fields for more septic systems. These, and other benefits, aren't emotional and don't generate the headlines that a drought does.

Throughout this country there are a myriad of local codes pertaining to water conservation. However, it is my personal opinion that a single, realistic, coherent policy such as your bill would do more to promote the saving of one of our most valued resources (water) than all the local codes put together.

Enclosed is literature on some of these water saving (Ultra-Low Flush) fixtures that will provide specifications and test results.

Thank you for your time.

Very truly yours,

J.S. HELBURN,
*Vice President.*

WATERSHED ASSOCIATION OF THE DELAWARE RIVER,
AN AFFILIATE OF THE AMERICAN LITTORAL SOCIETY,
*October 23, 1989*

Hon. RICHARD BRYAN,
*Chairman, Consumer Subcommittee, Hart Senate Office Building, Washington, DC.*

DEAR CHAIRMAN BRYAN: The Watershed Association of the Delaware River believes strongly in all forms of water use efficiency and we are therefore in complete support of S. 583.

We have promoted low consumption plumbing fixtures in the Delaware River Basin for some time and, as you are probably aware, the Delaware River Basin Commission earlier this year moved to require 1.6 gallon flush toilets in all new installations effective as of January 1991. In the process of doing so the Commission dilligently investigated all concerns over adverse impacts. We followed this process carefully and believe each objection was more than adequately addressed.

We foresee substantial rewards from this form of water use efficiency—reduced energy use in water supply and wastewater treatment, increased reliability of groundwater yield and better dry weather baseflows from streams in developed areas and a reduction in the need for new surface water supply impoundments are among them.

We urge rapid approval of S. 583.

Yours sincerely,

MARY ELLEN NOBLE,
*Director.*

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CONTROL FLUIDICS, INC.,
*Greenwich, CT, October 24, 1989.*

Hon. SENATOR RICHARD BYRAN,
*Chairman, Consumer Subcommittee Transportation, Senate Committee on Commerce, Science, and Transportation, Hart Senate Office Building, Washington, DC.*

DEAR SENATOR BYRAN: Control Fluidics, Inc. is an R&D company. We have concentrated our research efforts on revolutionary water conservation and filtration projects.

We have been following controversial issues on Ultra Low Flush toilets with great interest. We have also tested most of the manufacturers ULF toilets in our R&D lab.

CFI has spent the past nine years and in excess of 3½ million dollars developing a state of the art water/waste conservation toilet.

We have six patents on it in fifteen different countries. It meets all the ANSI 112.19.5 standards and is listed with BOCA and SBCCI code bodies.

It was tested at Stevens Institute of Technology in Hoboken, NJ for 2½ years to assure that it complied with ANSI A112.19.5 standards.

As you are aware one of the major concerns of the ASPE and some of the other trade associations is drainage problem "Backups" due to moving solids and paper with reduced amounts of water (1.6 gal.).

The test for this is referred to as the "Transport Test" and involves moving solids through a 4 inch diameter pipe 60 feet long with a ⅛ " per foot drop.

The "Fluidizer" toilet not only flushes on 2½ Quarts of water but also macerates the solids and actually de-fiberates the paper thereby fluidizing the waste before discharging it into the drain pipe under force from a positive placement pump. All of this is performed in 8 seconds per flush.

This also reduces construction costs by allowing the use of 2" drain lines, where codes permit, in place of the more expensive standard four inch drain lines.

This process also greatly reduces and in many cases virtually eliminates septic system pump outs.

The "Fluidizer" has a rated Fixture Unit Value of 1 Compared to the 3.5 gallon per flush water saving toilet which have a Fixture Unit Value rating of 5. This results in a lower TAP Fee cost in localities that assess a TAP FEE which runs as high as $800.00 in Orlando, FL predicated on the FUV of 5 compared to $200.00 on a FUV of 1.

We have had several proto-type "Fluidizer" toilets in field tests for the past five years with good success. We tested them in Massachusetts, Connecticut, New York, Vermont, New Jersey, Arizona, Bermuda and St. Croix, V.I.

We are presently researching the possibilities of a joint-venture, venture capitol, private investor, licensee or some other means to start production and marketing of

this timely state-of-the-art product. Our plans are to start production of the "Fluidizer" toilet in 1990.

We believe that the "Fluidizer" water/waste conservation toilet has the solution to many of the ULF toilet issues that has confronted other manufacturers.

I have taken the liberty to enclose a "Fluidizer" brochure for your perusal.

Sincerely,

DONALD A. JERMIER,
*President.*

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ASSOCIATION OF STATE AND INTERSTATE
WATER POLLUTION CONTROL ADMINISTRATORS,
*Washington, DC, October 24, 1989.*

Hon. RICHARD H. BRYAN,
*Chairman, Consumer Subcommittee, Committee on Commerce, Science, and Transportation, U.S. Senate, Washington, DC.*

DEAR MR. CHAIRMAN: The Association of State and Interstate Water Pollution Control Administrators (ASIWPCA) has reviewed the National Plumbing Products Efficiency Act introduced by Senator Fowler and provides the following comments for the record of the Consumer Subcommittee hearing of October 4. We generally support the bill, and urge the subcommittee to consider the refinements and improvements outlined below.

S. 583 sets standards for water use for new plumbing fixtures and appliances, and authorizes the development of test procedures to measure compliance with these standards. the bill also contains labeling requirements to convey water use information to consumers, and authorizes research related to water conservation.

States are concerned about the need to increase water conservation through the use of more efficient plumbing products. At least six States have enacted legislation or administrative rules to this effect, and several more are committed to do so. The benefits of reducing unnecessary flows to wastewater treatment plants are substantial. Reasonable Federal standards on plumbing efficiency could be quite helpful to the States, and the Fowler bill appears to be generally compatible with existing State policies.

The following observations highlight areas of possible refinement of the bill:

The standards proposed for some products will save more water than others. Standards for water closets and showerheads have the greatest potential for water savings, and should receive the attention necessary to resolve questions promptly and implement standards at the earliest practical date.

Labeling requirements for annual operating costs may not be effective for all covered products. The cost of water and sewer service varies widely, but the monetary savings to many consumers will be modest. Labeling information on the *amount* of water used and saved may be more persuasive.

Although Federal pre-emption of State standards is a concept ASIWPCA seldom supports, we are willing to consider it in this instance due to the problems created by a lack of uniformity—*provided* the Federal standard effectively promotes and reflects the state-of-the-art over time.

As standards are tightened in the future, as provided by the bill, attention must be directed to consumer acceptance and product adequacy, e.g., for showerhead standards. The committee report may need to clarify the responsibilities of the Secretary in this regard.

If the nation is to continue to make progress toward the water quality goals contained in the Clean Water Act, wastewater treatment facilities must continue to be improved. These improvements have been conservatively estimated at $83.5 billion in the Environmental Protection Agency's 1988 Needs Survey report on the "Assessment of Publicly Owned Treatment Facilities in the United States." While no one would argue that water conservation alone will eliminate these funding requirements, enactment of S. 583 could save water pollution control agencies substantial sums. Capital cost savings resulting from a reduction in indoor water use in new construction could total well over $1 billion. Further savings would be achieved as a result of the gradual replacement of inefficient fixtures with new products meeting the standards set by the bill. Some additional savings of operating costs that are related to flow volume, such as pumping costs, can also be anticipated.

For these reasons, we welcome the Consumer Subcommittee's interest in the Fowler bill, and recommend that it be favorably considered.

Sincerely,

ROBERTA HALEY SAVAGE,
*Executive Director.*

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CONSUMER FEDERATION OF AMERICA,
*October 25, 1989.*

Hon. RICHARD BRYAN,
*Chairman, Consumer Subcommittee, Committee on Commerce, Science, and Transportation, U.S. Senate, Washington, DC.*

DEAR MR. CHAIRMAN: Please accept this statement for the record of the hearing of the Consumer Subcommittee on October 4 regarding S. 583, the National Plumbing Products Efficiency Act. The Consumer Federation of America (CFA) consists of some 240 local, state, and national consumer organizations representing 50 million consumers. CFA is pleased to support S. 583, and we urge the Consumer Subcommittee to act favorably upon the bill.

This bill is important to consumers because more efficient plumbing fixtures provide a direct benefit to consumers in the form of lower bills for water and sewer costs, and an indirect benefit in the form of improvement of our environment. We wish to comment in particular on the following aspects of the bill:

*Federal Performance Standards.*— The system of federal performance standards authorized by the bill is much more likely to conserve water and consumer dollars than is the current patchwork of state and local regulations and voluntary standards. A significant and growing share of plumbing products are sold directly to consumers at the retail level for installation in existing homes, or to contractors and plumbers for installation in renovation and remodeling of existing structures. In most jurisdictions, these activities, in contrast to new construction, do not require a building or plumbing permit and thus are not covered by state or local standards that may be contained in building codes. Considering the rates of kitchen and bathroom remodeling compared to the rates of new construction, it is not unreasonable to assume that nearly half of the toilets and more than half of the showerheads and kitchen faucets installed each year are not subject to performance standards contained in state and local building codes.

When states seek to go beyond building codes and establish standards that apply to all products sold or installed within their jurisdiction, enforcement problems immediately arise. The market for plumbing products is national in scope, and states that choose to act in this arena must contend with non-conforming products shipped from out of state and overseas. It is clearly less efficient and practical to regulate hundreds or thousands of wholesale and retail outlets than to regulate a much smaller number of manufacturing facilities, as S. 583 proposes.

*Product Labeling Requirements.*— We are pleased with the labeling and marking requirements in the bill, patterned closely after the energy labeling program currently in effect for consumer appliances. The bill requires that products be labeled not only with their estimated annual operating costs or some other useful measure of water use, but also with the range of performance of other products of the same type. This will make it much easier for purchasers to do comparison shopping.

Similarly, the requirements for product marking are clearly more useful for consumers than the limited product marking contained in the voluntary industry standard. S. 583 would require each product to be permanently marked with both the manufacturer's name or trademark and the water use of the product. The current voluntary standard, by contrast, requires only that the product be marked with a cryptic "A112.18.1", rather than the design water use rate of the product. Although plumbing professionals may be able to interpret this jargon as demonstrating compliance with the American National Standards Institute voluntary standard A112.18.1 (Plumbing Fixture Fittings), the omission of the year in which the standard was promulgated means that the ordinary consumer cannot determine the flow-rate, since the rates in the standard are subject to periodic revision. Even this limited amount of information may be affixed by a label or tag that can be removed or deteriorates over time, rather than being permanently affixed to the product. Unless the product marking provisions of S. 583 becomes law, prospective home buyers or renters will thus remain uninformed about the performance of installed plumbing products.

The product marking requirements of the bill will also be useful to communities implementing large-scale fixture replacement programs. Permanent markings that

provide the rate of water use for each product will help local officials for years to come to distinguish conforming products from non-conforming products long after installation.

*Product availability and consumer choice.*— We were pleased to learn from the testimony of the Plumbing Manufacturers Institute that during 1990, U.S. production of low consumption toilets will reach 25% of total production—a full two years before the effective date of the standards contained in the bill. This suggests that the prospects are good for an orderly transition of the national market to more efficient products. To the extent that the subcommittee finds that certain specialized products that are manufactured in limited quantities are not likely to be available by the effective dates now in the bill, narrowly drawn extensions of these dates could, in our judgment, be considered. This would at least allow consumers to realize the benefits resulting from the new standards that would apply to most other products.

Much of the discussion about S. 583 has related to the question of how low-consumption toilets perform under a variety of existing conditions. We agree that this is an important question, since the product standards contained in the bill will apply to entire categories of products, not to the location or circumstance of their use.

The answer to this question is twofold. With regard to the effectiveness of flushing action, it is most likely that the marketplace will sort out products that perform well from those whose performance is barely acceptable, and the marketplace will reward producers of such products accordingly. With regard to performance in the drainline, there are at least four basic types of toilets. Some of these have drainline performance characteristics that exceed those of the gravity tank-type toilet using 3.5 gallons per flush that dominates the market today. For the isolated fixture that may be prone to drainline problems, building owners and local code officials have at least two options under the bill. Electromechanical toilets are available that can obviate drainline problems while staying well under 1.6 gallons per flush. Also, blowout fixtures are available and may be used where required by local codes. In short, there is no need to delay either the enactment of the bill or the effective dates for new standards simply out of concern for poor drainline performance in isolated fixtures.

S. 583 is likely to save substantial amounts of public funds for costs associated with water supply and wastewater treatment. With the steady reduction of federal funding for such purposes, these are costs that would ultimately be borne by consumers. Furthermore, consumers using septic systems—roughly 20% of all U.S. households—will realize direct additional savings from reduced hydraulic loading of septic fields and increased treatment efficiencies. Finally, enactment of S. 583 will save money for *all* purchasers of plumbing products, by boosting production runs of new, more efficient products, thereby lowering unit costs. To the extent that the current patchwork of state and local regulation is allowed to shore up the market for high-volume fixtures, costs to consumers for low-volume fixtures will be higher.

We urge your prompt passage of this important legislation.

Sincerely,

BARBARA J. KATZ,
*Legislative Counsel.*

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ASSOCIATION OF METROPOLITAN SEWERAGE AGENCIES,
*Washington, DC, October 25, 1989.*

Hon. RICHARD BRYAN,
*Chairman, Consumer Subcommittee, Committee on Commerce, Science, and Transportation, Hart Senate Office Building, Washington, DC.*

DEAR MR. CHAIRMAN: I am writing to you on behalf of the Association of Metropolitan Sewerage Agencies (AMSA) in regards to S. 583, the National Plumbing Fixtures Efficiency Act.

AMSA is comprised of over 100 of the largest municipal and public wastewater treatment agencies in the United States. AMSA members serve in excess of 90 million people, and treat a total flow of well over 13 billion gallons of wastewater per day.

Water conservation represents an important element in reducing the volumes of wastewater which need to be treated, and can have a beneficial impact on the costs associated with the conveyance and handling of wastewater. Effective water conservation programs may increase the useful lifetime of existing treatment facilities by extending the hydraulic capacity of those facilities, and thus delay the costs associ-

ated with expanding facilities due to increases in growth within the service area. AMSA supports the wise and judicious use of our natural resources, and applauds the objectives of S. 583 towards conserving water through increased plumbing fixture efficiency.

I would like to take this opportunity, however, to point out that reduced water usage can create some difficulties in the area of wastewater treatment. Sewage conveyance systems are designed with specific hydraulic characteristics, and a reduction in the volume of wastewater discharged to sewers can cause settling of solids and concurrent problems with odors and line blockage. Increasing the efficiency of plumbing fixtures also does not effect the mass of contaminants that must be ultimately treated, but merely reduces the volume of the transfer agent (water). This can lead to increased strength of wastewater, which in the most severe case could cause operational problems at the wastewater treatment facility. An additional fact to consider is that wastewater discharge permits are not written to take into account water conservation, and that even though a treatment facility may discharge less water because of conservation, the concentration of pollutants in that water may be higher than before. This will occur without any change in the mass of pollutants discharged from the treatment facility, but will still result in a permit violation since permit limits are typically designated in terms of concentration.

I hope that these comments have been helpful to you in your deliberations on S. 583. I would be happy to provide any additional information that you may request as work on the Plumbing Fixtures Efficiency Act proceeds.

Sincerely,

KEN KIRK,
*Executive Director.*

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A WEATHERIZATION CO., P.O. BOX 277,
*Arvada, CO, October 25, 1989.*

Hon. RICHARD BRYAN,
*Chairman, Consumer Subcommittee, Hart Senate Office Building, Washington, DC.*

DEAR HONORABLE MR. BRYAN: I have been involved in the Energy/Water Conservation business for the past six years, specializing in Blower Door Methodology and Air-Infiltration Control. Also the Direct Installation of water saving devices i.e. Low-Flow showerheads and aerators and Toilet Tank Dams.

After fifteen months research Ultra Low Volume toilets, I discovered to my delight the Universal-Rundle, Atlas 1.6 gallon. After having installed the U.L.V. some five months ago in my house, where there are two people living, I have noticed once again a drop in my sewer bill with absolutely no affects on my sewage system.

This is a product I advocate and sell nationally in my Water Conservation business and believe the plumbing code should be adopted to enforce the installation of Ultra Low Volume Toilets.

Thank you for your time and the opportunity to share some thoughts and beliefs about this product.

Sincerely yours,

JAMES LAULIS,
*Owner.*

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AMERICAN PUBLIC POWER ASSOCIATION,
*Washington DC, October 25, 1989.*

Hon. RICHARD H. BRYAN,
*Chairman, Subcommittee on the Consumer, Committee on Commerce, Science, and Transportation, U.S. Senate, Hart Senate Office Building, Washington, DC.*

DEAR MR. CHAIRMAN: On behalf of the American Public Power Association, the national service organization representing 1,750 locally-owned public power systems, I am pleased to comment for your subcommittee's hearing record on S. 583, the National Plumbing Products Efficiency Act of 1989, sponsored by Senator Wyche Fowler. The companion bill, H.R. 1185, has been introduced in the House by Representative Chet Atkins.

Senator Fowler's bill is modeled upon the National Appliance Energy Conservation Act of 1987, which established in federal law certain efficiency standards for electrical appliances. APPA was an early supporter of that legislation, which has been beneficial in lowering consumers' electric bills, in promoting the manufacture and purchase of energy efficient appliances, in assisting utilities to manage the demand for electricity, and in conserving an essential resource.

While APPA has not specifically addressed the question of national plumbing efficiency standards, we believe there are many similarities between such standards and the national appliance efficiency standards. Most notable are: (1) the need for uniformity of standards throughout the country; (2) consumer education leading to intelligent consumer decisions; (3) consumer benefits through lower costs for utility services; and (4) conservation of precious natural resources.

The need for uniform appliance standards was evident in the campaign for adoption of the national appliance efficiency standards. States had begun to set their own standards, which often differed from state to state, thus hampering interstate commerce. This was among the primary reasons the 100th Congress adopted national appliance efficiency standards. In 1987, appliance manufacturers favored a reduction in differing state regulations with implementation of a preemptive federal standard so their products could be purchased and used everywhere in the country. The same scenario—which can be expected to cause problems similar to those experienced with appliances—currently is the situation with plumbing equipment. Therefore, it is appropriate that Congress is reviewing efficiency standards for plumbing equipment.

Similar to the law establishing national appliance efficiency standards, consumer education is a major element of the legislation to establish national plumbing efficiency standards. With respect to appliances, manufacturers must place "energy guide labels" on all new appliances in seven categories, such as refrigerators, freezers, and water heaters. An "energy guide label" provides a prospective purchaser with such information as the estimated yearly energy cost in dollars of operating the appliance and shows how the appliance compares in energy efficiency with comparable models. This information is critical to a customer's acceptance of an energy efficient appliance because these appliances cost more to purchase—but the savings realized on the cost of operating such an appliance makes the higher purchase price worthwhile. S. 583 would require similar labeling of plumbing products to provide a customer with information on which to base an intelligent consumer decision.

Uniform national standards also would benefit consumers, particularly low-income individuals, renters, and new home buyers. Because water is an expensive commodity, the ability to use water more efficiently—and, thus, more cheaply—would help those living on low or fixed incomes to stretch their money. Renters and new home buyers would benefit because these two groups usually have little, if any, choice in the efficiency of the appliances in their homes. Despite the fact that homeowners and many renters pay their own utility bills, landlords and builders who have no direct financial interest in the efficiency of appliances usually select them. Uniform national standards would protect these two groups against inefficient plumbing products.

Water is used for municipal and industrial purposes, to generate electricity, for transportation and recreation, and to sustain aquatic wildlife. Given the multiple demands we put on this resource and given that these demands are growing, it is imprudent to waste water. Many APPA members are associated with cities that provide both power and water to customers. According to a 1987 survey, 71 percent of public power systems serve communities that also provide water utility services as a function of local government. These systems are well aware of the value of conservation. For instance, the recent successful campaign for adoption of state plumbing standards in California involved the California Municipal Utilities Association (CMUA), an APPA member. According to CMUA estimates, toilet flushing accounts for up to 40 percent of the water used in a typical home and the new standards will save approximately 100,000 acre-feet of water a year.

End use water conservation also can result in significant energy conservation. Electricity is used to pump water and to dispose of sewage; thus, reductions in water consumption can reduce the total pumping requirements of a municipal water system. Municipal water and wastewater pumping frequently is the single largest electric load for public power systems. On a national level, it is estimated that municipal water works account for approximately 7 percent of the total electrical energy used in this country. Therefore, important secondary benefits can be achieved by conserving water.

APPA also has addressed the critical issue of water conservation through its Task Force on Federal Water and Power Policies and agrees that increased attention must be given to end-use water conservation practices. A recent report of the Task Force stated that "aggressive end-use water conservation measures could create 'new' supplies of water" to be used to meet new or expanded needs. "An appropriate water conservation policy would be designed to ensure that all, or a great percentage of, water is actually applied to the intended use and not wasted . . . ," the Task

Force reported. There is no question about efficiency standards being an important element in conservation.

If APPA can supply any additional materials or information on implementation of the national appliance efficiency standards that will assist with Congress' work on proposed national plumbing standards, we will be happy to do so.

Sincerely,

LILIAN NEWBY,
*Legislative Representative.*

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UNITED STATES OF AMERICA,
FEDERAL TRADE COMMISSION,
*Washington, DC, October 27, 1989.*

Hon. ERNEST F. HOLLINGS,
*Chairman, Committee on Commerce, Science, and Transportation, U.S. Senate, Washington, DC.*

Hon. RICHARD H. BRYAN,
*Chairman, Consumer Subcommittee of the Committee on Commerce, Science, and Transportation, U.S. Senate, Washington, DC.*

DEAR CHAIRMEN HOLLINGS AND BRYAN: Thank you for your recent letter requesting the views of the Federal Trade Commission on S. 583, the National Plumbing Products Efficiency Act of 1989. If enacted, this legislation would establish national standards for the manufacture and labeling of certain plumbing products principally to preserve and protect the nation's water resources. The Commission appreciates the opportunity to submit comments on this important legislation.

The Committee has asked us to comment on those parts of the legislation that give the Federal Trade Commission certain administrative responsibilities. Specifically, the legislation directs the Commission to promulgate labeling disclosure requirements for certain plumbing products.[1] The Commission's rule would have to require covered products to bear a label disclosing the estimated annual operating cost of the labeled product and information on the range of estimated annual operating costs of comparable products, unless specific conditions are met.

We have not been asked to comment on whether Congress should set national water use standards for certain plumbing products, and we do not address that issue. However, in commenting on the labeling provisions of the legislation, we have considered how the implementation of the proposed standards could affect the proposed labeling disclosure scheme. We also briefly address Title II of S. 583, which pertains to test procedures for dishwashers and clothes washers, because it concerns products the Commission is presently regulating.

BACKGROUND

The Section 104 labeling provisions, as well as other parts of the legislation, are modeled after the Energy Policy and Conservation Act (EPCA) (Public Law 94-163, 42 U.S.C. § 6291 *et seq.*). That legislation is the authority for the Commission's Appliance Labeling Rule, which requires the disclosure of the energy costs or efficiency ratings of certain household appliances, such as refrigerators, dishwashers, room air conditioners and furnances (16 C.F.R. Part 305). Before turning to our comments on Section 104, it would be helpful to describe briefly the Commission's experience with EPCA and the Appliance Labeling Rule.

EPCA was enacted during the 1970's, after the country had experienced energy crises that demonstrated the vital need to conserve energy. At that time, the household appliances covered by EPCA were not generally the subject of other regulation, nor did Federal minimum efficiency standards exist. As directed by EPCA, the Commission promulgated the Appliance Labeling Rule, which requires eight of the 13 categories of products covered by EPCA to adhere to certain labeling requirements.[2]

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[1] At this time the affected products are water closets, urinals, lavatory and kitchen faucets, and shower heads. The legislation requires, however, that the Secretary of Commerce study whether other products should be covered.

[2] Pursuant to the authority granted the Commission by EPCA, the remaining product categories were exempted either because labeling was not technologically or economically feasible or because the Commission found that labeling would not assist consumers in making purchasing decisions. The products exempted for these reasons are: televisions, clothes dryers, kitchen ranges and ovens, humidifiers and dehumidifiers, and space heaters. The Commission's decision to exempt these products is fully explained in the Statement of Basis and Purpose for the Rule. 44 Fed. Reg. 66466, at 66467-69 (Nov. 19, 1979).

The National Appliance Energy Conservation Amendments of 1988 (NAECA 88) (Public Law 100-337) added a 14th category (fluorescent lamp ballasts), and the Commission accordingly conducted a rulemaking proceeding to require labeling of these products too.[3]

Under the Commission's rule, the products generally must bear a label, called an EnergyGuide, disclosing the energy cost or efficiency for the labeled product.[4] The label also shows where that product falls among the range of other products in that category (and in most cases the category is also defined by size). Because the individual products and range numbers are based on representative national energy cost figures, as determined by the Department of Energy (DOE), most of the labels also contain additional cost data that consumers can use to determine, for comparative purposes, how much the labeled product would cost to operate based on energy rates where they live. The purpose of the required information is to allow consumers to take into account in their purchasing decisions the energy efficiency or costs of competing products.[5]

To keep the label information current, under EPCA and the rule, manufacturers are required to submit annually to the Commission cost and efficiency data for their products. The Commission analyzes this information to determine whether the ranges for the products have changed by more than 15 percent. If they have, the Commission publishes a notice requiring manufacturers to use new ranges on their labels. Our evaluation of these data has shown that the efficiency of the covered products overall is steadily improving.

Although the rule appears to be working well, over the years the Commission's staff received numberous suggestions from many groups and individuals about possible improvements or changes to the rule. Many of these suggestions also were expressed in comments during the review of the Rule the Commission determined to conduct a rulemaking to consider numerous changes to the rule. That rulemaking is currently ongoing.

One of the principal issues in the rulemaking is the effect on the Appliance Labeling Rule of minimum efficiency standards Congress recently mandated for various applicances.[6] A number of comments have stated that the minimum efficiency standards will reduce the number of models available in a product category. This, in turn, according to the comments, will contract the range of energy usage and make the range data so much less useful that it should no longer be required. Neither the Commission nor its staff has yet taken a position on these comments in the rulemaking. However, we note them here because the same arguments would likely be made in connection with the effect of S. 583's maximum water usage standards on plumbing product labels contemplated by the legislation.

TITLE I

Section 104 of the bill appears designed to accomplish the same goals as the EnergyGuides under the Appliance Labeling Rule. It would require disclosure of water cost information for the product labeled and information about the range of estimated annual operating costs for a covered product.[7] (In the alternative, instead of dollar costs, the Commission could require disclosure of a different measure of water use.) Based on our experience with the Appliance Labeling Rule, and concerns raised at the hearing about the maximum water use standards, the Commission raises for the Committee's consideration whether the Section 104 proposed labeling and marking requirements will be the most cost-effective way to encourage water conservation, for the following reasons.[8]

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[3] 54 Fed. Reg. 28031 (July 5, 1989).

[4] Which measure is used is specified by the rule depending on which would be more helpful for consumers. Representative samples of EnergyGuides are attached.

[5] For example, according to the American Council for an Energy-Efficient Economy, if consumers purchase the most energy efficient refrigerators, clothes and dish washers, they could save $146 a year. "Top-Rated Appliances Shave $150 From Yearly Electric Bill," The Washington, Post, Oct. 14, 1989 at page E3.

[6] National Appliance Energy Conservation Act of 1987, 42 U.S.C. § 6291 *et seq.*

[7] Section 104, however, is broader than its counterpart in EPCA. Unlike EPCA, this legislation requires, in addition to product labeling, the permanent marking of *each component* of a covered product with the manufacturer's name or trademark and the water use of the product.

[8] The Commission recognizes that the legislation permits the Commission to dispense with labeling if it is not technologically or economically feasible or if we determine that labeling is not likely to assist consumers. However, we believe you may find our views, which implicitly consider these criteria, helpful in determining whether Section 104 should continue to be included in S. 583.

AVAILABILITY OF RANGE DATA

Although currently there are plumbing products available for sale using different water amounts, the array of different products available is considerably smaller than is the variety of household appliances affected by EPCA and the Commission's rule. For example, there are currently 11 sizes of refrigerator-freezers available, and the ranges of estimated yearly energy cost in each size grouping vary greatly (*e.g.*, in the 20.5 to 22.4 cubic feet grouping, the low end of the range is $68 and the high end is $145).[9] In contrast, according to the statement of the Plumbing Manufacturers Institute (PMI), surveys on faucets and showerhead production show that nearly 100 percent of these products are water conservation models, using 3 gallons flow per minute (gpm).[10] Consequently, the current range difference in water use for these products is relatively small.[11]

However, if the S. 583 standards (2 gpm for lavatory faucets, and 2.5 gpm for kitchen faucets and showerheads) are enacted, manufacturers will only be able to produce products meeting (or exceeding) the standards. For some period of time, of course, nonconforming products will still be available, but only until those preexisting supplies are exhausted. At that point there may well be no "range" of products.[12] Theoretically, manufacturers could make products that use even less water than the standards, and required efficiency disclosures might even produce an incentive to do so (as they appear to have done for products covered by the Appliance Labeling Rule). This is by no means certain to occur, however.

The PMI believes, for example, that the legislative proposal to reduce showerhead flow rates (from 3 gpm to 2.5) will be counterproductive because most consumers will find it unacceptable and will try to override the flow control system.[13] One witness at the hearing on S. 583 also commented that the "potential for scalding in the shower increases with each progressive restriction of flow in the showerhead."[14] We are not in a position to evaluate the accuracy of nor the weight to be given to these comments. However, if the predictions of the industry members who testified about consumer acceptance of the proposed flow rates and possible performance problems are correct, it seems unlikely that in the foreseeable future there will be much competition to produce products with even lower flow rates than will be mandated by S. 583.[15]

Similar concerns are applicable to the proposal for water closets. Although currently in-place home water closets may use as much as 5 or sometimes even 7 gallons per flush (gpf), a 1982 PMI survey indicated that 98 percent of the water closet production consisted of water conservation models, i.e., those using 3.5 gpf or less.[16] Further, the National Association of Plumbing-Heating-Cooling Contractors (NAPHCC) states that the 3.5 gpf toilet has been the standard for about 10 years in most parts of the country.[17] The legislative proposal to mandate a 1.6 gpf standard for water closets is being opposed by many industry members.[18] One of the major

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[9] 54 Fed. Reg. 21051 (May 16, 1989).

[10] PMI Statement on S. 583 at page 3.

[11] It seems possible that the difference among products presently produced may be so small that water cost disclosures would not assist consumers in making purchasing decisions. Compare, for example, the Commission's decision to exempt clothes dryers and kitchen ranges from its rule because the annual operating costs of these appliances were not different enough for the figures to influence consumers in making their purchasing decisions. For gas dryers, the difference between the annual cost of running the least efficient and most efficient models was four dollars; for electric dryers, it was five dollars. 44 Fed. Reg. 66466, at 66467-69 (Nov. 19, 1979).

[12] The exception to this could be if state and local governments obtain exemptions from the standards from the Secretary of Commerce, as permitted by the legislation. Such exemptions, however, could complicate any uniform labeling requirements, as well as manufacturer's marketing efforts. For example, should nonconforming products, legally allowed in only a localized area, be included in national range data?

[13] PMI statement on S. 583 at page 4.

[14] Statement of Patrick J. Higgins, President of P.J. Higgins and Associates, Inc. (a consulting agency for the plumbing industry) on S. 583, referring to recent studies by Delta Faucet Company and historical studies by Symmons Industries, at page 9. But see the statement of Duane Cutler, of Volt Energy Systems (testifying on the basis of his experience as the former director of Sales and Marketing for Niagara Conservation Corp., a manufacturer of 2.5 gpm showerheads) reporting on Niagara's favorable experience selling these products.

[15] Indeed, even if the testifying industry members are wrong, but their perception is deeply and widely held, competition in this regard may not materialize.

[16] PMI statement on S. 583 at page 3. We presume this percentage has remained at or around this amount, or has been bettered in subsequent years.

[17] NAPHHC statement on S. 583 at page 4.

[18] However, industry members commented favorably on the American National Standards Institute (ANSI) consideration of 1.6 gpf as a performance standard. Industry members contend

Continued

bases of their opposition is concern about the effect of the reduced flow on plumbing systems that were designed for a larger volume flush. A number of technical questions were raised in connection with this issue.[19]

Consequently, as with faucets and showerheads, there currently is not a large array of water closet choices (in terms of water usage). Further, if the performance concerns raised by industry members about a 1.6 gpf standard for water closets are correct, it appears highly unlikely that manufacturers will be seriously attempting to produce water closets that use even less water.

Thus, in the plumbing products area, it may be less likely that meaningful range information will be available than it is for products covered under the Appliance Labeling Rule. In our view, without such information, product labels are not likely to assist consumers in making purchasing decisions. Consequently, although there obviously will be costs associated with collecting the required information, printing it and affixing it to each product in a specified manner, the Commission is not certain that there will be significant benefits from product labeling. In this respect, product labeling may not be cost effective.

### ALTERNATIVES TO PRODUCT LABELING

Increasing consumer awareness about water costs and encouraging water conservation efforts might be better achieved by consumer education campaigns and other means than by product labeling.[20] For example, water companies might use bill inserts to pass on water savings tips or offer special rates or other incentives to homeowners to reduce their water consumption.[21] One incentive might be to offer rebates to encourage retrofitting of existing inefficient fixtures with new, low flow ones. This might also encourage retrofitting earlier than might otherwise be done. A number of utility companies already use rebate programs to encourage, for example, the purchase of highly efficient, but more expensive, central air conditioners. Currently, Texas Utilities Electric Company offers rebates to consumers and contractors who purchase central air conditioners that have a seasonal energy efficiency rating of at least 10.00 (currently the range is 5.85 to 15.00).

### OTHER ISSUES IN TITLE I

In addition to the above observations about the proposed labeling requirements, we have several technical concerns about Title I. First, Section 104(a) states that labeling shall be required for each covered product, unless "the Commission determines under subsection (b)(4) that labeling and marking is not technologically or economically feasible." Subsection (b)(4) refers to these grounds, but also allows the Commission to dispense with labeling and marking if the Commission determines it "is not likely to assist consumers in purchasing decisions." We think the alternative basis for not requiring labeling is helpful. However, the fact that this language is not referenced in Section 104(a) may create an ambiguity that could affect the amount of discretion the Commission has to consider whether labeling and marking is necessary.

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that worthy conservation goals would be addressed by an ANSI Standard, but the standard would not be limited to only water conservation criteria. Instead, an ANSI standard would address all aspects of plumbing product performance to ensure proper functioning. Statement of PMI at page 2. See also statement of Patrick J. Higgins.

[19] See statement of the Ad Hoc Committee on Water Conservation, presented by George Bliss, of the United Association of Plumbers and Pipefitters, which refers to a recently completed report by the Congressional Research Service (CRS). The CRS is quoted as saying "A number of topics merit further study in connection with developing water conservation policies. Prominent among the issues are technical questions about performance of low-water-use plumbing fixtures, including so-called drain line carry and impact on hydraulics of waste water collection systems." Ad Hoc Committee statement at page 4.

[20] Indeed, campaigns informing consumers about how much water their current household products use and how many gallons they could save through retrofitting seem more likely to be effective than product labels that would provide only information about products a consumer might buy in the future.

[21] Because water and sewer costs are relatively low, using gallon differences, rather than dollar differences is probably more effective in educational materials. For example, Figure 1 of the statement of Amy Vickers on S. 583 indicates that the estimated yearly cost of a 3.5 gpf toilet is $41, while the cost for a 1.6 gpf toilet is $17. The $24 cost difference is not nearly as dramatic as the gallon usage; 7,000 gallons for a 1.6 gpf toilet compared to 16,400 gallons for a 3.5 gpf toilet. (Note that Figure 1 depicts what may be currently available and not necessarily what a label would show if the S. 583 standards were enacted.)

TITLE II

Title II of S. 583 amends certain EPCA requirements pertaining to dishwashers and clothes washers. These products are covered by the Commission's Appliance Labeling Rule, and EnergyGuide labels must be displayed on them.

Title II only changes the sections of EPCA pertaining to definitions, DOE test procedures and DOE standards. Specifically, the amendments would result in a slight modification to the DOE tests to include the retail cost of the water consumed during the testing of these two types of products. Under Title II, DOE would only have to add a provision that the water used be multiplied by a national average cost for water and that the result be added to the cost of the energy used to heat the water and run the appliance.

Since Section 324(c) of EPCA mandates that the Commission's labeling rule require a label that discloses the product's estimated annual operating cost (or its efficiency rating), the Commission would not need to amend its labeling rule if Title II of S. 583 were enacted. The rule already requires disclosure of the estimated annual operating costs of these products. The only change would be that the figures would now include the cost of water consumed during the tests. Thus, Title II does not present any apparent implementation problems for the Commission.[22]

Second, under Section 104(b)(1), the Commission is required to publish a proposed labeling rule not later than 30 days after a proposed test procedure for the product has been published. The comparable provision in EPCA refers to the date when a test procedure has been prescribed. Thus, under EPCA, the Commission only begins the process of determining whether labeling is necessary after a final test procedure that can be used as the basis for labeling is available. As currently drafted, Section 104(b)(1) is ambiguous. It could be construed as requiring the Commission to commence the labeling decisionmaking process prematurely. We suggest that the word "published" be replaced with "prescribed." We also suggest that a provision comparable to Section 336 of EPCA (42 U.S.C. § 6303), which describes the rulemaking procedures to be used (i.e., notice and comment pursuant to 5 U.S.C. § 553, and an opportunity for a hearing) be added to Title I to make it clear that the more complex procedures found in Section 18 of the FTC Act (15 U.S.C. § 57a) are not required.

Third, S. 583 does not contain as comprehensive a provision concerning the duties of a manufacturer as that contained in EPCA. If labeling were to be required, it would be helpful if manufacturers were required to submit information about their models in production and, annually, data respecting water consumption developed in accordance with applicable test procedures. These data are the basis for updating the product labels so the information stays current and relevant. In this regard, we suggest adding to S. 583 provisions comparable to Sections 326(b) (1) and (4) of EPCA (42 U.S.C. §§ 6296(b) (1) and (4)).

Fourth, we note that Section 110(b)(2) does not provide that notice must be given to the Commission prior to the commencement of suit against the agency under Section 110(a)(2), as is provided in the comparable provision of EPCA (42 U.S.C. § 335(b)(2)). This omission can be rectified by adding "and Commission" at the end of Section 110(b)(2).

Finally, Section 115 authorizes appropriations for several years to carry out Title I. However, it does not specify how the appropriations are to be divided among the various agencies charged with implementing Title I. We recommend that the legislation specify, as was done in EPCA, that the FTC is to receive some portion of the appropriation to carry out its rulemaking and enforcement responsibilities under Title I.

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[22] The Commission has not considered, however, the advisability of a separate water use label for dishwashers and clothes washers products pursuant to the provisions of Title I. This issue was raised in the statements of the Whirlpool Corporation and the Association of Home Appliance Manufacturers (AHAM). Their statements indicated concern that these products could, at some point, be included as "covered products" under Title I, and thus be required to have separate water use labels. If Whirlpool and AHAM are correct that there will only be a small variance between the water consumption of the different models of these products, then it is possible that consumers would not be influenced by labels that disclose this information. In light of these comments, the Committee may wish to consider whether dishwashers and clothes washers should be exempted from potential classification as additional plumbing products by the Secretary of Commerce under the authority granted by Section 101(b).

*CONCLUSION*

The Commission hopes that these comments will be a useful addition to the record and that they assist the Committee as it further considers S. 583.

By direction of the Commission.

JANET D. STEIGER,
*Chairman.*

Room Air Conditioner
Capacity: 8,000 BTU/hr

(Name of Corporation)
Model(s) SA 714, SA 718

**ENERGYGUIDE**

Models with the most efficient energy rating number use less energy and cost less to operate.

Models with 7800 to 8299 BTU's cool about the same space.

Least efficient model
3.4

**7.3**
THIS MODEL

Most efficient model
8.5

Energy Efficiency Rating (EER)

This energy rating is based on U.S. Government standard tests.

**How much will this model cost you to run yearly?**

| Yearly hours of use | | 250 | 750 | 1000 | 2000 | 3000 |
|---|---|---|---|---|---|---|
| | | Estimated yearly $ cost shown below | | | | |
| Cost per kilowatt hour | 2¢ | $7 | $20 | $28 | $56 | $84 |
| | 4¢ | $14 | $41 | $56 | $112 | $168 |
| | 6¢ | $20 | $61 | $80 | $160 | $240 |
| | 8¢ | $27 | $82 | $108 | $216 | $324 |
| | 10¢ | $34 | $102 | $136 | $272 | $408 |
| | 12¢ | $41 | $122 | $163 | $326 | $489 |

Ask your salesperson or local utility for the energy rate (cost per kilowatt hour) in your area. Your cost will vary depending on your local energy rate and how you use the product.

**Important** Removal of this label before consumer purchase is a violation of federal law (42 U.S.C. 6302)

(Part No. 20648)

This is a Mock-Up Label With Estimated Costs

NORTH MARIN WATER DISTRICT,
*Novato, CA, September 28, 1989.*

Hon. RICHARD H. BRYAN,
*Chairman, Consumer Subcommittee, Hart Senate Office Building, Washington, DC.*

DEAR SENATOR BRYAN: I understand the Consumer Sub-committee of the Senate Committee on Commerce, Science and Transportation is holding a hearing on the subject legislation on October 4. Please accept the following statement as the testimony of North Marin Water District:

STATEMENT OF NORTH MARIN WATER DISTRICT TO THE SENATE CONSUMER SUBCOMMITTEE

The North Marin Water District has long had an aggressive program to seek out sufficient water supplies for its municipal service area (53,000 people located in the greater Novato area of Marin County, California). In addition, over ten years ago, the District recognized the need to take steps to achieve greater water use efficiency by its customers. The District has pioneered many successful water conservation strategies following the basic concept that the customer should have the ultimate choice as to how he/she uses water and that the best water conservation strategies should rely upon inducements, incentives or other activities which convince the customer it is in his/her self-interest to conserve.

Notwithstanding the above, urban water conservation has now evolved to the point to justify improving the water use efficiency of toilets through regulation. The North Marin Water District has sponsored a 1.6 gallon per flush ultra low volume (ULV) bill here in California, and it has received the approval of both houses of the California bicameral legislature. The bill now rests before Governor Deukmejian for his signature. The bill would require that all residential toilets installed to serve new development meet the 1.6 gallon per flush standard commencing January 1, 1992.

The technology to design and build 1.6 gallon flush toilets is not new, and in fact the United States is one of the few developed countries in the world that clings to a norm of 3.5 gallons or greater. In the last decade, however, a number of manufacturers have placed ULV's using less than 1.6 gallons per flush on the market. Among these are Universal Rundle, Eljer, Briggs, Kohler, Armitage Shanks, Crane, Mansfield, Western Pottery, and Microphor. The most recent entree is American Standard. Furthermore, ULV's are appearing in hardware store chains and their advertising (the most recent one I saw was a Yard Bird's advertisement in the San Francisco Bay Area). Even Sears Roebuck and Company carries a model under its own name made by Universal Rundle. Several states and some large cities now require ULV's in new construction: Massachusetts, Washington, City of New York and City of Los Angeles. A growing number of water utilities (and some sewer utilities) require ULV's in new construction. Some even require installation of ULV's upon transfer of improved property.

Field and laboratory research is sufficient to make the judgement that ULV's work satisfactorily and will cause no significant problems downstream in the sewer collection system. One exception is a problem we live with today and that is a single toilet installed on a long flat lateral within a given building. This problem is rare but occasionally is found in a situation such as a large industrial plant which covers a lot of square footage and has a restroom far removed from the city sewer which may receive little use. Even a 3.5 or 5 gallon flush is insufficient for this rare and special case. For the vast amount of situations, however, ULV's will have no significant impact on downstream conveyance of waste. In fact, the hydraulics of many models improve movement of waste in the collection system. This is due to the fact that their design typically results in a greater "hydraulic punch" per gallon of water used (technically, plotting the rate of discharge vs. time, although the area under the discharge curve is less, the peak discharge rate achieved is greater).

It is therefore quite legitimate to require the installation of ULV's in new construction. By doing so, conversion of the country to the 1.6 gallon flush standard will be much more rapid and efficient and realization of the water savings will thereby occur more quickly. Furthermore, poor performing ULV's are more likely to be sorted out and drop from competition in the marketplace.

In closing, the North Marin Water District supports passage of S. 583 in the form presented to you by Senator Fowler. The provisions of the bill which provide for test procedures for classified products and labeling of same are especially important and will enhance customer knowledge at the time of purchase. We have seen this happen with energy using appliances, and we can expect similar results with water using appliances. Furthermore, such labeling will facilitate rebate programs that

many water utilities will be considering in the future to help induce customers to utilize more efficient water using appliances.

In conclusion, the water future of the United States is much bleaker than its water past. The level of use that most citizens have come to enjoy must be reduced. The good news is that this can be done without changing lifestyles noticeably. S.583 is an example of such a means. It deserves your support.

JOHN OLAF NELSON,
*General Manager.*

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